

amateur radio



VOL. 46, No. 6

JUNE 1978

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COVER PHOTO	
Captain Tanongsek Tuvivun of the Royal Thai Army (left) presented technical literature by Ian Hunt VK5ED (right) on behalf of the VKS Division. Supervising the event is Bob Edgar VK5RS (left rear) and Ron Calmuz VK5FY (right rear). See story "Goodwill Through International Amateur Radio", page 25.	

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QSP —

NEW ERA

The Federal Council meeting at the 1978 Federal Convention, realising that this is an era of intense technical and community changes, decided that more thought must now be given to the years following WARC 79.

Much needs to be done to fit the WIA to the requirements of the membership which is now much more diverse in technical interests.

Many views about the future have been expressed by individual members and it is these which are most important in forward planning. Have you made your views known?

It must be recognised that WARC 79 is not an ending, but is in fact the beginning of a new era.

D. A. WARDLAW VK3ADW
Federal President

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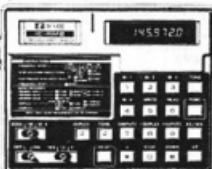
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WIANEWS

At this time of the year the Federal Convention occupies the thoughts of Australian amateur administrators. The usual report will be published in AR next month, but it would be useful to refer to some of the more important items here and now.

The guest of honour this year was Mr. E. J. Wilkinson, the First Assistant Secretary of the Radio Frequency Management Branch of the Postal and Telecommunications Department. Mr. Green, the Secretary of the Department, regretted inability to attend due to other commitments. A letter RBA/11/31 of 21st April from him arrived during the Convention. The text of this letter is as follows:

"Thank you for your letter of 31 March 1978 concerning matters associated with the examination of candidates for the Novice Amateur Radio Operator's Certificate of Proficiency.

The study guide prepared by the Institute has now been examined in relation to the official Department Syllabus: as a consequence it is considered that the study guide is suitable for use by intending candidates for the Novice qualification.

A copy of the Department's Syllabus in its final format is attached for your retention. I expect that quantities of this document will be available for distribution in the near future."

Mr. Wilkinson answered a range of questions put to him by the Convention delegates on numerous amateur radio matters. In his short introduction he spoke about preparations for WARC 79 dominating the frequency management scene at this point in time and complimented the Institute upon the case presented to the APG on behalf of the amateur service. The Citizens' Radio Service had presented the Department with a serious problem of sheer numbers overloading the system. Legalisation of the service had changed the overall picture but lawlessness through piracy still continued and highlighted the inadequacies of the legislation. It was hoped that the introduction of a new Act might now be expedited, but the best estimates placed the date around autumn of 1979.

After dealing with various aspects of the amateur examinations area, Mr. Wilkinson expressed the concern of Government about the ease of acquiring transmitting equipment and the studies currently being made into this question.

No easy solution appeared available.

In answer to numerous questions he spoke about interference to the operation of consumer equipment brought about by the proliferation of "CB" gear, the Morse speed problems in Novice exams being appreciated and now at the point of being resolved, the various problems relating to TV channels 0 and 5A being unlikely to be resolved for a considerable time, the fact that the CRS must be more self regulatory within its own frequency allocations.

The Department recognises that interference with repeater channels is essentially one for the Department, but help from amateurs is required to detect the offenders, collaboration was the real answer to the nuisance, UHF broadcasting allocations being related to WARC 79 and the fact that the Department did not recommend continuance of the use of the 11 metre band by the CRS beyond June 1982.

The Convention heard reports from Mr. Michael Owen VK3KI, and Dr. Wardlaw on the subjects of WARC 79 and IARU. Provision was made in the budget for the latter's attendance at important conferences. He and Mr. Peter Wollenden would be attending the IARU Region 3 Conference in Bangkok later this year in which numerous questions would be down for consideration including the IARU position post WARC 79. The importance was stressed of the Special Planning Meeting of the CCR in October, which related to technical matters affecting WARC 79.

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Mr. Alf Chandler VK3LC attended the Convention and spoke with some feeling about the paucity of support in Australia for Intruder Watch operations. He paid tribute to the work done in this sphere by the USA and the UK administrations, whereas in Australia it seemed the case that reports of an intruder from a few observers passed unnoticed.

During the Convention the RD Contest trophy, refurbished and gold-plated by the VK5 Division after being rescued from the wreckage of Darwin's Cyclone Tracy, was formally handed over to VK1 Division, the winners last year. A motion was passed that this become an annual convention event. In discussions on the RD Contest the fact emerged that an in-depth statistical evaluation of the scoring table was desired. Peter Brown's Contest Champion Trophy was also on display and evoked discussion. The VK2 delegate advised that as it was that Division's turn to manage the Federal Contests, an offer by the Orange and District ARC to undertake this important work was accepted. Neil Pentford VK6NE was congratulated upon his management of the VK/ZL/O Contest biennially with NZART and was thanked for his continuing interest in managing this contest.

A number of working groups were appointed for speeding up the work of the Convention in the specialised areas relating to repeaters, educational matters in general, ATV, IARU/WARC 79 and the Financial Sub-Committee previously appointed last year. It proved possible for experts or alternate Councillors in every Division except VK6 to be represented on the more important working groups. Only VK6 was represented by one delegate, all the other Divisions had at least two.

In discussing the work of the Federal Historian, mention was made of the very recent publication of "A History of Radio in South Australia, 1897-1977", by John F. Ross, which included a lengthy section devoted to the Wireless Institute and another book recently launched by Gp. Capt. E. R. (Bon) Hall on the RAAF radio story. In the debate on Max Hull's report stress was laid on the necessity for members to keep the Institute in mind whenever an Old Timer passes on lest any historical records and possessions are unknowingly thrown away into the local tip by the deceased's family.

A motion arising from the VHF/UHF Advisory Committee's report was the expression of thanks to John Hackworth VK5QZ for continuing with his faithful work in calculating distances and invigilating activities relating to DX records.

Discussions on the report by the Chairman of the Federal RTTY Committee brought out the necessity of avoiding unilateral action by individual Divisions or Groups on RTTY matters in advance of general acceptance at the Federal level.

Apathy by members in general in relation to WICEN affairs was one question debated at some length on the report by the Federal WICEN Co-ordinator. Regret was expressed that Rex Overblade VK1QJ would be standing down from this post after achieving so much with NDO liaison in particular.

The report by the Chairman of the Publications Committee and matters arising from this brought out several points relating to AR, the Call Book and the Log Book. The Managing Editor, Bruce Bathols VK3UV, expressed disappointment at the interest of members in their own magazine; as for example the dearth of photographs (especially front cover photographs) and that there was a limit to the amount of work which can be done by the volunteers on the Committee. Some time was taken up in a working group on the question of any competition from the Amateur Radio Action publication to be published shortly. The 1977 Call Book came in for considerable criticism, but all the points were already known.

Another working group dealt with the Agenda Items relating in general to organisational matters, recruiting and publicity. One motion arising from this area was the need to solicit funds for WARC 79 from all available outside sources. Another was the current payment of separate licence fees where different modes are operated on the same site — for example, beacons, repeaters, etc.; further details are needed from users.

The Federal Council agreed upon the necessity for the Federal President and IARU Liaison Officer to attend the NZART Conference 1978 during June to seek solidarity between the two sister organisations relating to WARC 79 and IARU affairs in general. Mention was also made of a CCIR Regional Conference to be held in Australia early next year. The Federal President advised he had been invited to attend the CCIR SPM in October as a member of the Australian delegation.

In a discussion on the 1979 budget it was decided that no final decision relating to Federal dues should be made before the end of August, although on available information no increase appeared necessary for the third year in succession because of increased membership and continuing economies. The vital needs to increase the impact of recruiting, to provide services to members and to promote amateur radio generally throughout the community were examined in depth, targets identified and concerted action promoted. The production of promotional and display material is to be followed through without delay. Small identity stickers for cars were considered necessary but promotional bumper/window stickers were not favoured. It was agreed that for future conventions the central organisation should pay for the attendance of one alternate Councillor from each Division to the same extent that the expenses of the Federal Councillor are now paid.

The Federal Council elected the same Executive members for 1978-79 as in 1977-78, with the exception that John Bennett VK3ZA replaces Jim Lloyd, now transferred away from Melbourne. The 1979 Convention will be held in Melbourne at the same venue from 28th to 30th April.

Unfortunately, time is not available to go into further detail at this stage but many members will want to know the fate of the numerous Agenda Items relating to Novice operations. The motion to approach the Department to have the Novice segment on 80 metres extended up to 3625 kHz was passed by a majority vote, but all the other items relating to a common band for all licensees in particular, higher power, etc., were rejected after considerable debate. One of the strongest arguments in the rejections was the incentive for Novices to upgrade.

During the Convention videotapes in colour were viewed of the material listed in WIANEWS last month (May AR, page 6). The dates of showing for the HSV7 amateur programme became available at the Convention and will no doubt be referred to in Divisional broadcasts.

A reply has been sent to the Department in relation to the conditions to be imposed on the operation of 10 metre band beacons.

During April a letter arrived from the Minister for Post and Telecommunications, and is reproduced hereunder for the information of members —

"I refer to your letter to my predecessor, the Hon. E. L. Robinson, M.P., regarding matters of concern to the WIA which you believe have flowed from the introduction of the Citizens' Radio Service (CRS) in Australia. I note that you are more particularly concerned at the apparent extent of illegal radio operations and the alleged inability of any Department to control such operations. I am aware of those representations made direct to my Department by the Institute some time ago in the matter and note also that you were of the opinion that these had not seemed to have received appropriate consideration, perhaps because of the pressure generated as a result of the introduction of the CRS. In point of fact, however, I am informed that in the meantime some of the issues raised by the Institute have been answered in letter form or have been the subject of ongoing discussions between representatives of the WIA and my Department. I am also advised that arrangements have been made for the outstanding issues to be further discussed in a joint WIA/P. and T. Department consultative Committee which is now to be set up.

Needless to say I appreciate the anxiety expressed by the Institute at the apparent extent of illegal radio opera-

tions and the difficulties being faced in controlling such operations. Regrettably, the Wireless Telegraphy Act and Regulations, the legislation under which radio communication stations are authorised in Australia, presently contain no provision to enable restrictions to be imposed on the importation or sale of radio communications equipment in this country. I should mention however that the question of the measures it is necessary to introduce to provide for an effective measure of control to be exercised in this matter is currently being examined.

I can appreciate your concern at what you believe to be an intolerable degree of radio frequency lawlessness ■

THIS AFFECTS YOU!!

The following letters are reproduced in prominence due to the urgent messages they contain.

The Channel 5A problem is only one of the multitude of items which the WIA is trying to cope with — to date without much success.

We need the support of ALL amateurs in becoming members of the WIA, to provide a UNITED FORCE in protecting our frequencies.

Forget any previous backbiting, silly squabbles, etc. — your frequencies are continually under threat, from many sources. Look at the CB fiasco.

Show this page to a non-member, and if it doesn't make him/her want to act and join the WIA, then he/she might just as well forget amateur radio as a hobby — it just won't exist if we cannot use our frequencies.

5/4/78.

The Editor,
Dear Sir,

Please find enclosed a letter received here from the Prime Minister in relation to the proposed Channel 5A at Mt. Dundas. Please print it in its entirety to allow the local population of Western Victoria Amateurs to absorb the information.

I have heard comments from "technically competent" persons that an offset in the video and sound carriers will minimise the interference problem. The reasons for offsetting these is to avoid co-channel beat with Loxton, S.A., and Wollongong, N.S.W., just like the Channel O system. Beware the "ides of March 1980" when all translators in the west will take the parent Channel 5A and the proposed Mt. Arapiles site is included in this proposal. No matter where you are in the west somewhere, sometime you will interfere with the TV system. This includes FM operators, both mobile and base. In fact it is more likely that FM will suffer than SSB. For those who still don't believe, ask anyone in Wollongong or Newcastle, or ask Hughie VK3BC next time you hear him on, and I assure you that won't be 2 metres.

So much for WARC 79. Here is a slice of an international band ripped out from under Amateurs for the fourth time in Australia.

With three non-standard channels in the six metre and four in the two metre band, we head the world in technical prowess.

Steve Gregory VK3OT. ■

Prime Minister,
Canberra.

21 March 1978.

Dear Mr. Gregory,
Thank you for your letter of 16 December 1977 concerning the proposed national television transmitter on Mount Dundas.

I have been advised by the Minister for Post and Telecommunications that the transmitter will operate on channel 5A. The decision to use this channel was reached after considerable engineering studies. The Minister advised that, bearing in mind the number of services that will be provided in the area and the lack of available frequencies, it is considered that there is no suitable alternative available.

While it is very unlikely that interference will be caused to amateur radio, I am informed there is a likelihood of occasional interference to the television reception of residents living in close proximity to an amateur radio installation. The Minister has advised me that if this occurs, it may be necessary to limit the hours of operation of amateur radio as has been the case in other areas where channels O and 5A are being utilised.

Yours sincerely,

Malcolm Fraser.

Mr. S. Gregory,
3HA, Hamilton,
P.O. Box 414,
Hamilton, Vic. 3300.

WHAT THE PRESS SAYS— "THE 5A CHANNEL"

The use of the 5A channel for ethnic telecasting and other special needs is a very practical proposition. All the feasibility tests have been made already, and it can be received without adjustment by most receivers in Melbourne.

The channel is, in fact, the emergency/disaster channel and its everyday use for ethnic, special and educational purposes should be no problem for a Government determined to honor its election promises.

Should a national emergency situation occur it would instantly revert to the original use for which it was intended.

The alternative would be to allocate a channel in the UHF band, more expensive but in line with global TV development. ■

evident in Australia, especially in the 27 MHz region of the spectrum. It is true that this situation has been due to some extent to the current staffing situation in my Department. The situation has also been aggravated by problems which have stemmed from industrial grievances and disputes. I am confident, however, that as a result of action which has recently been initiated, resources will become available which will enable an adequate measure of control to be exercised over such services.

Yours sincerely,
Sgd. A. A. Staley." ■

QSP

PIRATES

"Everybody worth their salt that's around today is up on 27.235 you know, or on two metres. You've got 500 channels to choose from, they've got the use of repeaters and everything, you might as well get up on Two and enjoy yourself". Robert Carruthers being interviewed in CB Action magazine. Carruthers is a self-confessed pirate. The interview is quite an interesting one but it's a bit hard on the blood pressure of the amateur. This Robert Carruthers lad is the "Inventor" of the jamming device, which had quite a bit of publicity in the press recently, to counteract the effect of the next door CB'er on your TV. First issue SWARS "Feedback" from VK2NP1.

DAPTO MOONBOUNCE

The Dapto Institute was severely damaged by vandals sometime before 8th February and again a week later. Locks were broken, windows smashed, wiring removed, cabling ripped out, the floor holed. Hems stolen and a fire lit in one of the rooms. On 2nd March the site was inspected with representatives from the University and the decision reluctantly made that adequate security on the site was not possible especially as the dish is too vulnerable. This item may now be removed, if possible, elsewhere. Thus ends the Dapto Moonbounce Project after some 8 years of work. One readily identifiable item stolen was a brass morse keystand of the demolished wooden base, another was a 240V Solysol about 4 inches in diameter, painted grey. Report by Lyle VK2ALU in "The Propagator", Mar. '78.

NEW PREFIX

Radio Commun. Dec. '77 quotes the ITU as having allocated the callsign series P4A-P4Z provisionally to the Netherlands Antilles.

WARC 79 WARC 79 WARC 79 WARC 79

USE THEM
OR
LOSE THEM

WARC 79 WARC 79 WARC 79 WARC 79

AFTERTHOUGHTS

SCANNER FOR THE KYOKUTO SXR11
APRIL AR 1976

The 0.025 uF capacitor between pins 10 and 11 of ICB should be 25 uF. ■

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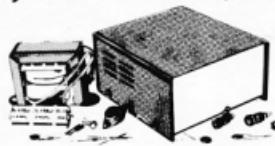


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See the review in MAY 1978 E.A.



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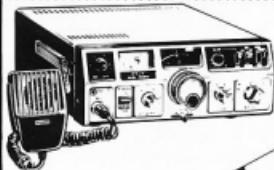
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TWO DUMMY LOADS

M. N. O'Burill VK3WW
3 Maxwell Street, LaTor 3075

Dummy loads are essential in any shack where transmitter experiments are made. The two loads described here are easy to build and present a resistive load to the transmitter throughout the HF bands. Even at VHF the reactive component is small and insignificant in most cases.

The first load was made of ten 750 ohm resistors in parallel. As the picture shows they are soldered in a "ladder" style to two copper strips. One copper strip connects to the co-ax input and one to frame — in this case the lid of a coffee tin.

You can use any type of co-ax socket that suits — I have added a banana socket for RF pickup should I need it, for power measurements etc.

The resistors measure 3 cm by 1 cm and should be good for at least two watts each, thus making the load good for 20 watts. Of course, this is not enough for the average HF transceiver used today so the trick is to fill your coffee tin with transformer oil, put the lid on and your re-

sitors dissipate their heat into the oil. Most commonly used rigs won't even make the tin warm.

I picked up the resistors in a disposals shop, but there is no reason why ordinary carbon resistors can't be used. The higher their "dry dissipation" rating the better.

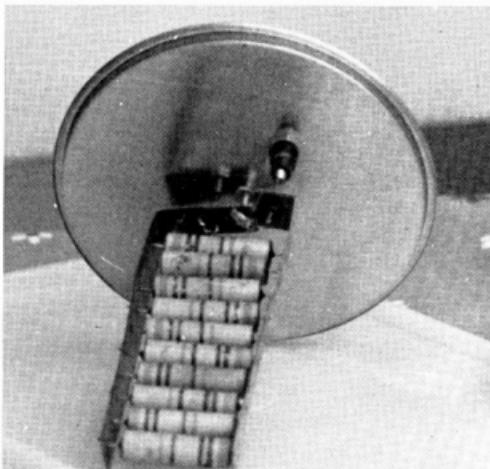
Transformer oil is not widely advertised but is used industrially by engineering firms, oil refineries etc. The oil used must have no metallic content so most motor oils are unsuitable. I think some of the vegetable oils sold in supermarkets would be OK but I haven't tried them.

A word of warning: Before putting oil in the tin carefully solder all seams or the oil will seep out.

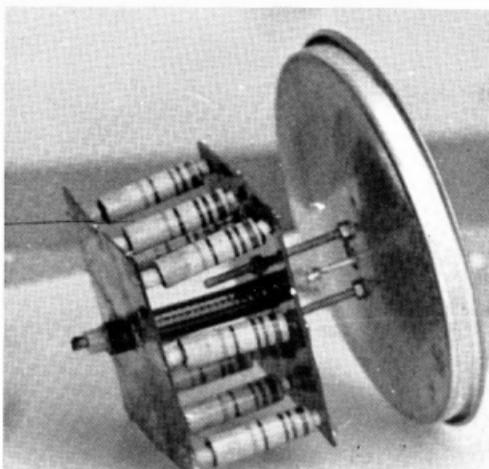
The second load consists of nine 470 ohm resistors in parallel giving a load of 52 ohms. In this case the resistors are soldered to two copper plates about 2½ in. square. The lower plate connects to the co-ax input and the upper plate is mounted to the lid of the can. The plates were made from an offcut of 2½" pipe which I split and flattened out.

I have not drawn any diagrams as these are very simple projects and the photographs show the layout well enough.

It would be hard to build any other piece of test equipment as cheaply as these two loads and they are very useful in the shack. ■



52 ohm load



75 ohm load

MORE POWER FOR THE KEN KP202

Fred Stirk VK2ABC
164 Park Parade, Beacon Hill, N.S.W. 2100

Let's face it, the batteries don't last all that long with the Ken KP202 unit and they always expire when you want them most! The adapter unit described here goes a long way to overcoming some of the problems. The batteries can then be used for purely pedestrian activities.

The idea is to run the Ken from the car battery and generator combination. Not me, you say; well! that's how I figured it at first, but then thought there must be a safe way of doing it. This is the result.

To begin with, the most important point is the output of your car generator. If you can't do it yourself have a qualified auto electrician adjust the regulator so that the voltage across the battery will not rise beyond 14.2-14.3 volts at a reasonable r.p.m. of the motor. The battery and all connections must be first class so that there is no possibility of sudden voltage variations. Having arranged the voltage regulator so that around 14.2 is read at the cigarette lighter, plug in the adaptor and check the output with an accurate meter using a 200 ohm load. The voltage should vary from approximately 12.0 to 12.8 with speed variations when the adaptor is switched to LO. This will be satisfactory for the battery supply as fully charged Nicad batteries rise above 13.5V before being used. The 200 ohm load represents the Ken when receiving. The consumption rises to over 100 mA on receive with higher output levels.

Connection to the Ken is made via a DC power plug/socket combination using a socket added to the side of the Ken case adjacent to the press to talk switch. Care is needed in locating this socket as space is very limited on the inside of the case. Wire the socket so that the internal battery supply is broken when the DC plug is inserted. (See picture.)

The circuit is very simple but appears satisfactory in use providing the input voltage is controlled within the limits mentioned.

OPERATION

The operation is as follows. The on/off switch is used for obvious reasons and in the ON position lights a red LED via a 1000 ohm resistor. Battery voltage is then available for the HI/LO switch which in

the LO position supplies power via two EM401 diodes in series, or similar LV diodes of about 1A rating. The voltage drop across each diode will be about 0.7-0.8V so the supply will now be in the 12.0-12.8V area. To hold this with some assurance to approximately 13V maximum, a Zener diode is fitted across the output. Actually 6.8 and 6.2V units in series were used in the original and have proved satisfactory.

In the LO position, power is supplied to a green LED indicator via a 330 ohm resistor. The resistors to the LEDs were chosen to provide about the same brilliance from both. When the motor is not running the supply voltage will of course fall to the car battery voltage. Under these conditions the second switch is placed in the HI position, shorting the diodes, providing full supply to the Ken unit and extinguishing the green LED.

FUSE

The cigarette lighter connection was originally acquired from a National cassette player. The rear section of the plug was removed and the front section secured to a suitable small box with Araldite. With this particular plug a fuse is incorporated, and is a worthwhile safeguard. By unscrewing the front section the fuse can be easily replaced. A 2A unit will be fine. The output lead for connection to the Ken is taken through the base of the box via a Neoprene shroud so the wire will be out of the way of the dashboard controls.

The diodes incorporated as droppers are also a polarity safeguard. This installation uses a negative ground system. Should the opposite apply it will be necessary to reverse the polarity of all the semi-conductors, and also to insulate the antenna from the car. With a small gutter grip quarter wave antenna connected, it's amazing what can be done with a couple of watts from a comfortable position in the car, either in motion or at rest. Happy mobileering on two, fellas. ■

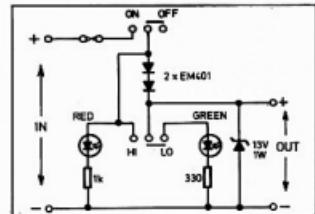


Figure 1



KP202 with adaptor

QSP

LANGUAGES
Bob Cyril Quinlan of the Marist Brothers High School at Eastwood, N.S.W. under call sign VK2GACQ has been the centre of a media snowball resulting from on air French, German and English language practice contacts with K8KKA. From Zero Beat, Mar. '78.

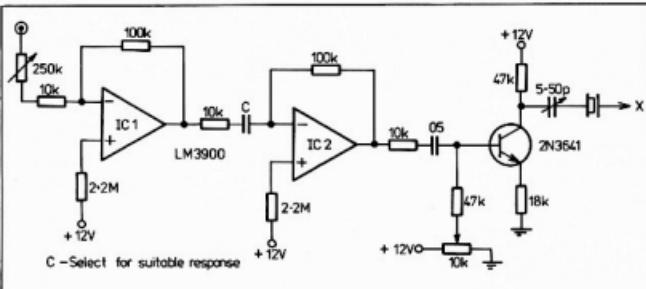


Fig. 4: Microphone Amplifier and Modulator

TRY THIS

WITH THE TECHNICAL EDITORS

TWO-TUBE SSB PHASING RIG Or Get Your Friends' Feet Wet With 7 Watts!

The following article caused intense interest when published in AR, July 1961. As far as we know no-one has yet produced a solid state rig that is as simple — three active devices for 7 watts of SSB out. If you think that sounds like a challenge, you are correct.

Leo Boisvert W1HIE has come up with the end-all of simplest sideband transmitters, this man, is the least! We have the SSB AR's journal "The Sidebander" (Feb. 61) to thank for this information.

This little rig is clean cut and wrung out to the very minimum of parts that will put out a clean SSB signal. First off, the RF signal is fixed phased and so is the audio, but due to the fact that we are using a carbon mike with its limited audio band pass, it really works out fine for fixed phasing.

Measurements were made in actual operation and we came up with these figures:

- 1,200 cycles—30 dB suppression
- 2,500 cycles—20 dB suppression
- 500 cycles—15 dB suppression.

This may not be commercial SSB, but it beats the pants off DSB!

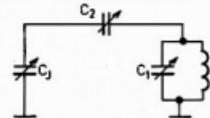
Construction of this unit requires no special parts and at that, the percentages are real loose. It is only necessary that the tuned circuits resonate at the operating frequency and that the audio coupling transformer have a 600 ohm output to the diode modulator. For this purpose I have used an ARCS Rx output transformer.

It is important that as little as possible of the xtal oscillator voltage get into the fields of the coils L2-3-4. Keep the oscillator coil L1 as far from the other coils as possible to avoid trouble in nulling out

the balanced modulator. The diodes must be matched in pairs as to forward resistance. Don't think that by adding an extra audio tube and xtal mike that you will improve the rig. The secret of the quality is in the carbon mike and its limited band pass; and added band pass in the audio section will cause the fixed phasing to go too far out at both ends. If you want to build this rig for use on any of the other bands you can do so by making the tuned circuits resonant at the desired frequency but keep in mind that the RF phasing unit will have to be changed to present about 100 ohms to the balanced modulator and the link. This means that you will need only one half the capacity of Cx for twice the frequency.

Tuning up the rig is simple; unbalance one pot and tune all coil slugs for maximum output. Tune the out pie network L4, and output capacitor for maximum. Then adjust the balance pots for minimum output. You are now in business and ready

EQUIVALENT CIRCUIT OF OSCILLATOR TANK



$$f_0 = \frac{1}{2\pi\sqrt{LC_T}} \quad C_T = \left(\frac{C_2 C_1}{C_2 + C_1} \right) + C_1$$

Let $f_0 = 16\text{MHz}$ $C_1 = 15\text{pF}$
 Then $L = \frac{1}{\omega^2 C_T}$ $[\omega = 2\pi f_0]$
 $= 5.2\mu\text{H}$

Fig. 6

to be called a liar for it is not possible to build a phasing rig with only two tubes! Or is it?

PARTS LIST

- L1—35 turns No. 30 wire. Link, 12 turns No. 30 on cold end.
- L2—16 turns No. 26 wire. Link, 6 turns No. 30 to centre of coil.
- L3—35 turns No. 30 wire. Link, 6 turns No. 30 on cold end.
- L4—50 turns No. 28 wire on $\frac{1}{2}$ inch coil form, slug tuned.
- Coils L1, L2 and L3 are wound on $\frac{1}{4}$ inch coil forms, slug tuned.
- All capacitors marked "M" are mica; all others can be ceramic.
- Cx—350 pF for 75 metres. One half capacity doubles frequency.
- T1—Carbon mike to grid transformer.
- T2—Plate to 600 ohms.
- Ch2 or 3 pi chokes (not critical).
- D1—1N38, 1N64 or most any diode; providing they are matched.
- R1, R2—1,000 ohms, carbon pots.

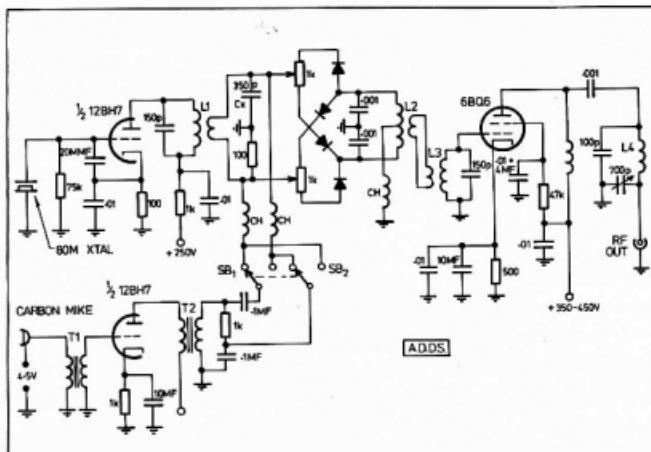


Figure 1

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AN ULTRA LOW-NOISE FET VIDICON AMPLIFIER

Andrew Pierson

1 Bindana Avenue, Salisbury Park, SA 5109

As indicated in the previous article describing a low-cost vidicon amplifier (Amateur Radio, September 1977), a more advanced version has been developed. In addition to ultra low-noise performance, this design offers facilities for line-by-line clamping, signal blanking, sync insertion and a 75 ohm line driver output stage.

The circuitry to be presented here is the complete video signal processing chain, from the target of the camera tube to the composite video output socket. It is shown in figures 1 and 2, where the vidicon amplifier itself extends from Q1 to Q6. Since the majority of general comments made about the first amplifier also apply to this design, I would recommend that the earlier article be read before proceeding with this text.

CIRCUIT DESCRIPTION — AMPLIFIER

The AC target load impedance is 50k ohms, and is made up of the target bias feed resistor and the gate earth return resistor (each 100k ohms) in parallel. In this circuit, a field effect transistor (Q1) in a common drain (i.e. source follower) configuration is used to obtain the necessary impedance transformation between the target load and the amplifier input stage. The input resistance of the FET is extremely high, and has almost no effect on the target load impedance, as determined by the two resistors previously mentioned. The input capacitance of the FET is very low, and this results in the total target shunt capacity being kept to an absolute minimum. The HF gain (i.e. compensation) requirements of the following amplifier stages can therefore be relaxed, with the result that noise at these frequencies is greatly reduced. The FET's own contribution to the noise spectrum is also less than that from a conventional transistor in the same circuit configuration.

Because the signal amplitude from the vidicon target is relatively low, it is permissible to self-bias Q1 by means of its IDSS current. Since this parameter may be anywhere between 2 and 20 mA, the variation in offset voltage developed across the source load resistor may be quite large. This potential may therefore be above or below the bias voltage at the base of Q2, so a 5 uF reversible polarity electrolytic capacitor has been fabricated from two 10 uF tantalum "TAG" types and

a 33k ohm resistor, as shown. Just in passing, it would be a very rare occurrence nowadays to come upon a new 2N3819 with an IDSS figure of 2 mA. Most new 2N3819s that I have tested measured around 8 to 10 mA, which is ideal for this application.

The "active" portion of the amplifier is Q2-Q6 inclusive, and all these stages are DC coupled to improve reliability and also to economise on coupling components. Operating point stability is assured by means of DC feedback, applied across all of the stages.

Q2 and Q3 form an NPN-PNP amplifier pair which produce a wide band voltage gain of 9.5 times. Q4 and Q5 form a further DC coupled amplifier pair, but frequency-sensitive networks are placed across their emitter resistors, so that the voltage gain of the amplifier increases smoothly with increasing frequency. Q4 is used to provide high frequency compensation, and also a small but variable portion of the low frequency compensation. The following stage (Q5) provides most of the low frequency lift.

Q4 has a minimum voltage gain of 4.7 times, but the high frequency compensation network (the 1 nF capacitor across the emitter resistor) causes the voltage gain to rise with increasing frequency at a rate drawing ever closer to 6 dB per octave (as the 100 ohm emitter resistor and low frequency network assume less importance), until the gain-bandwidth product limitation of Q4 (300 MHz) causes this lift to turn over and finally decrease. A low frequency compensation network also shares the emitter resistor of Q4, thereby causing a small portion of this characteristic to be applied simultaneously with the high frequency lift. The maximum additional low frequency compensation available (i.e. with the LF COMP potentiometer fully clockwise) can never exceed 6 dB, because the 100 ohm resistor in series with the network is equal to the emitter resistor of Q4.

Q5 has a minimum voltage gain of unity, but the low frequency compensation network (the 1 nF capacitor in series with a 100 ohm resistor placed across the emitter resistor) causes this figure to rise with increasing frequency, so that the loss due to the input circuit of the amplifier is almost cancelled out. The cancellation is made complete by adjusting the additional low frequency lift network associated with the emitter circuit of Q4.

It can be seen that the amplifier's gain vs frequency characteristic is the sum

total of the effects of the three networks discussed. The low frequency compensation is variable over a limited range, and this should be adjusted for minimum smearing of objects in the reproduced picture. For more information on how this type of adjustment operates, the reader is referred to the earlier article. Also, please note that the compensation characteristics given are appropriate only, because loading effects on the preceding amplifier stage by the decreasing input impedance of the following stage have not been taken into account.

Q6 is a wide band amplifier with a voltage gain of approximately 3 times, and serves to bring the output level up to the required 700 mV p-p under normal operating conditions. It also serves to invert the phase of the video waveform, so that white areas in the picture are positive-going. As mentioned before, DC feedback is applied over the stages Q2-Q6, and this loop provides a convenient means to adjust the amplifier's operating bias. The AMP BIAS potentiometer should be adjusted to produce a DC potential of 8V at point "A". Note that the feedback loop operates for DC and very low frequency AC signals only, as it is heavily decoupled. It has no effect on the video waveform, even at the frame frequency.

OPERATING PRINCIPLES — SIGNAL PROCESSING

Since the signal output from the camera tube target is AC coupled to the input of the amplifier (it would be extremely difficult and inconvenient to arrange DC coupling), the DC component of the video waveform is lost. Because sync pulses must be added to the blanking level in the video waveform, we must know exactly what voltage the black level corresponds to, in order to make arrangements for the sync pulses to extend 300 mV in a negative direction from this level. Fortunately, since the scanning beam in the camera tube is cut off during the line and frame blanking periods, the output from the amplifier during these times corresponds to true black in the picture. Because the line blanking periods occur regularly (every 64 uS) during the scanning process, it is possible to re-set the black level to any convenient potential with the aid of a line-by-line clamp, which is driven by line sync or blanking pulses from the camera's sync generator.

One may expect the output from a camera tube amplifier to be completely quiet during the line blanking periods, but this is hardly ever the case. They are often full of nasty transients etc. and most of

these are usually traceable to induced voltage from the collapse of magnetic flux associated with the line scan retrace. They can also be caused by induced signals when line-synchronized (7.8 kHz) invertors change state, or can even come from the sync generator circuitry by means of earth currents. Whatever the source of these signals, the blanking periods must be "cleaned up" before signal processing can continue. In normal practice, clamping and blanking period switching takes place in two distinct steps. In some circuits, two switches are used in addition to the clamp, making three steps in all.

CIRCUIT DESCRIPTION — CLAMP AND BLANKING SWITCH

The circuit arrangement used in this design performs the two required functions simultaneously, by means of a very "hard" clamp which is driven from the composite blanking waveform. Because of the very low "on" impedance of the clamp, it forces the output level to the set-up potential, and this action completely overrides any signal which is present. Thus, the signal is both clamped and composite blanked in one action.

The video signal present at the collector of Q6 is coupled to the clamp circuit Q8-Q9 via a 100 nF capacitor. This sets the clamp time constant to a value which results in only a very small voltage "drop" during one line period (i.e. the time between successive clamp pulses). The clamp transistor is Q8 and its operation is very simple. When a 12V positive-going composite blanking signal is applied to the base of the emitter follower Q7, the voltage therefore present at its emitter forces current through the base-emitter junction of Q8 via the 1k ohm resistor, and also via the bypassed SET-UP potentiometer in the emitter circuit of Q8. The result of this current flow is that Q8 is saturated during the line and frame blanking periods, thereby bringing the clamp potential to the emitter voltage of Q8. This is the blanking level, and can be varied by adjusting the resistance value of the SET-UP potentiometer, which is wired as a rheostat. This action varies the average current flowing in the base-emitter junction of Q8,

and hence the average potential developed at the emitter of Q8 by the passage of this current through the SET-UP potentiometer and the 220 ohm resistor. Because the composite blanking waveform contains a component at the frame frequency, a large (1000 μ F) bypass capacitor is required at the emitter of Q8 to ensure that the set-up potential does not vary during the frame period.

In order to buffer the high impedance output of the line-by-line clamp from the sync addition and output stages, the super-alpha pair of cascaded emitter followers Q9 and Q10 is used. This combination provides a minimum current gain of 4×10^4 times. In order to make doubly sure that any signal remaining below level is clipped off, the emitter load resistor of Q9 is returned to a potential of 3.85V, established by a resistive divider between the +12V rail and earth. The SET-UP control is adjusted so that at the blanking level Q9 is just starting to conduct.

VIDICON BLANKING

Whilst on the subject of blanking, there is another aspect which should be discussed. This concerns the mechanics of blanking the vidicon camera tube during the line and frame scanning retrace periods. For many years, this function was performed by the application of a large amplitude negative-going pulse to the control grid of the vidicon. However, it is not necessary to completely cut off the scanning beam. Since the scanned face of the photoconductive target is stabilized at cathode potential (i.e. 0V) by means of the electron beam, signal blanking may be effected making the potential on the scanned face more positive during the blanking intervals. This is achieved very simply by applying a positive-going composite blanking signal to the cathode. An NPN switching transistor with a 1k ohm collector load operating from +12V rail will provide a more than adequate voltage swing for this purpose. The composite blanking input to the processing circuitry has also been designed to operate from a 12V positive-going waveform, so only a single source of signal is required for all the camera's blanking requirements. A

side-benefit of blanking the vidicon in this manner is that since the beam current to the accelerator anode is not chopped at composite blanking rate, filtering of this supply becomes much easier.

CIRCUIT DESCRIPTION — SYNC ADDER

When the SET-UP control is correctly adjusted, the blanking level at the emitter of Q10 will be 3.2V. In order to add the composite sync signal, it is merely necessary to depress the blanking level 300 mW (i.e. down to 2.9V) during the sync periods. This is performed by means of a switchable resistive attenuator, which is keyed by the composite sync waveform. The blanked video is fed to the base of the output driver transistor (Q11) via a 100 ohm resistor. When the 1k ohm resistor and 1k ohm potentiometer combination from the base of Q11 is grounded by the composite sync pulses, a DC voltage division of the required order is created. The sync amplitude is set to 300 mV by means of the 1k ohm potentiometer. The limits of adjustment are 220 mV — 380 mV, i.e. +80 mV.

CIRCUIT DESCRIPTION — OUTPUT STAGE

An emitter follower has been employed to buffer the sync addition stage from the low impedance (75 ohm) output line. Because of power dissipation requirements, a BFY50 or BFY51 medium power transistor mounted in a heatsink has been specified. The composite video waveform is AC coupled to the line via a 1000 μ F electrolytic capacitor, and this allows the line to be terminated without introducing frame tilt to the waveform. Remember that co-axial cable is a transmission line, and for correct operation should be terminated in its characteristic impedance. However, if the driving impedance is low, it is permissible to drive short lengths of cable unterminated. When operating in this mode, the 10k ohm resistor across the output line prevents the occurrence of a positive DC potential on the line, due to leakage effects within the coupling capacitor. Long lengths of co-axial cable should always be terminated, in order to prevent ringing and high frequency deterioration of the transmitted signal.

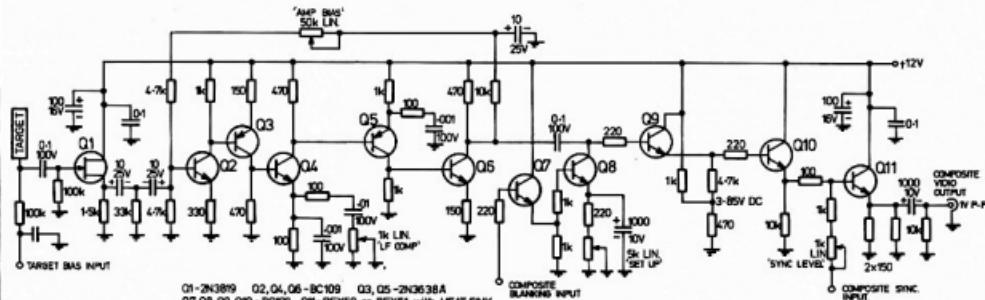


Figure 1: Nitro-Low-Methane FAME Method Accuracy

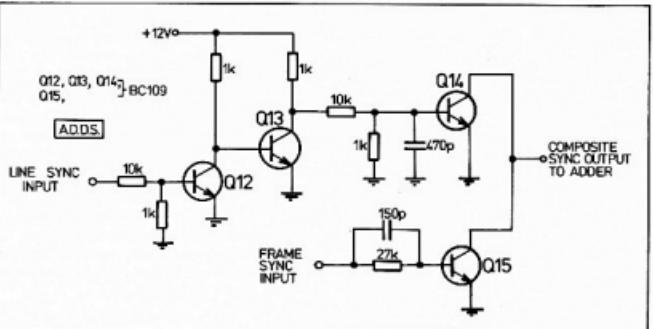


Fig. 2: Sync Mixing Arrangements.

CIRCUIT DESCRIPTION — COMPOSITE SYNC GENERATION

The circuit in figure 2 shows a simple method of generating a composite sync waveform from individual line and frame sync inputs. Since the processing circuitry requires a ground closure during sync periods, an "OR" gate has been formed by Q14 and Q15 with a common collector connection. If either transistor is turned "on", the output waveform is switched to sync level. Positive-going 12V pulses are required for both line and frame inputs.

The line sync pulse is applied to the base of Q12 via the 10k/1k resistive divider. Q13 is directly coupled to Q12, and serves to invert the line sync pulse so that it is again positive-going. This pulse is coupled to the base of Q14 via another 10k/1k resistive divider. Q14 is therefore saturated during the line sync intervals, thus operating the "OR" gate.

Now, Q12 and Q13 may seem superfluous, but this is not so. Their purpose (together with Q14) is to introduce a propagation delay of 1 μ s to the line sync pulse, so producing a line "front porch" in the assembled composite video waveform. This can be seen in figure 3. A portion of this delay is attributable to the normal propagation delays through Q12, Q13 and Q14. The remainder is produced by the two 10k/1k networks, which operate in the following manner. Sharp edged positive-going pulses are applied to the base-emitter junctions of Q12 and Q14 via 10k ohm resistors. These form integrator networks with the base-emitter capacitances, and so some time will elapse before the potentials across the base-emitter junctions reach their cut-in values, i.e. about 650 mV. In the case of Q14, additional capacitance has been added. This also serves to limit the rise and fall times of the added sync pulse to a realistic value.

When the positive-going pulses cease, the charge stored in the base-emitter junctions of Q12 and Q14 maintains these transistors in conduction until this charge is bled away via the 1k ohm resistors. The value of 1k ohm has been chosen to pro-

duce a total pulse "lengthening" of 1 μ s. So we see that the line sync pulse has had 1 μ s chopped off the beginning and 1 μ s added on to the end, i.e. it is still 5 μ s long, but delayed by 1 μ s. Incidentally, if you are supplying mixed syncs they may be passed through this network, since the 1 μ s delay is of little consequence to the frame sync pulse.

If it is to be added separately, the frame sync pulse is applied via the 27k ohm resistor and 150 pF "speed-up" capacitor to the base of Q15, which saturates during the frame sync intervals, thus operating the "OR" gate.

Figure 3 shows the output waveform at line rate produced by the clamping and sync insertion circuitry. Figure 4 shows the assembled line sync pulse in greater detail. The total current drawn from the

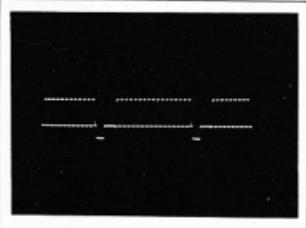


Fig. 3: Output Video Waveform (Line Rate)

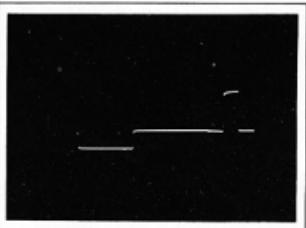


Fig. 4: Output Video Waveform (Line Rate — Expanded X Scale)

+12V supply rail by the circuitry in figures 1 and 2 will vary considerably with set-up adjustments and picture content, but it should be between 100 mA and 150 mA.

CONSTRUCTIONAL DETAILS

If you are laying out a PCB, remember to keep the input stage well away from the output stages, and also make the earth tracks as wide as possible. Common impedance earth paths are usually inevitable, and it is always advisable to keep their resistance and inductance to an absolute minimum. All resistors have dissipations of less than $\frac{1}{4}$ W, and the values specified are from the E12 series. They should be good quality 5 per cent tolerance cracked carbon or metal film types. The LF COMP, AMP BIAS and SYNC LEVEL potentiometers must have non-inductive (e.g. carbon) elements. The SET-UP potentiometer is not critical, but a carbon type will be the most economical. All capacitor values up to and including 100 nF should be polyester film "Greencaps", except the 100 nF rail bypasses, which are Hi-K ceramic types. The 10 μ F electrolytic capacitors are tantalum "TAG" types, and the 100 μ F and 1000 μ F values are conventional aluminium foil electrolytics. The transistors and FET specified may be by any manufacturer, provided that they meet the original specifications for these devices. This is very important, and substitute types should NOT be used. For general comments about the installation procedure, see the paragraph headed INSTALLATION in the previous article.

ADJUSTMENT PROCEDURE

1. Ground the gate of Q1, and measure the DC potential at the collector of Q6 (point "A") with a VTVM or multimeter. Adjust the AMP BIAS potentiometer to give 8.0V. Remove the ground from the gate of Q1.
2. Terminate the composite video output line with a 75 ohm load, and observe the output waveform with a CRO. Turn the SET-UP potentiometer fully clockwise. Now, back off the control VERY SLOWLY (its time constant is very long) until the lowest excursions of the video components are just beginning to be clipped off. Advance the control DEAD SLOW until the black areas in the picture are not crushed.
3. Adjust the SYNC LEVEL control to produce a sync pulse amplitude of 300 mV in the composite video waveform.
4. On a displayed picture, adjust the LF COMP potentiometer for minimum smearing. For more information, see the paragraph headed ADJUSTMENT PROCEDURE in the previous article.

SENSITIVITY

With the prototype amplifier, when using a one inch vidicon operating with a target voltage of +30V, an 11.4 25mm lens, and an inside scene under fluorescent illumination, the video component of the composite output waveform was 500 mV p-p.

NOISE

With a short-circuited input, the wide band noise as measured at point "A" was 3 mV

p-p. The total input capacity of the measuring instrument was 87 pF, which would have produced a -3 dB point of 4.07 MHz for the purposes of this measurement. This figure is very low, and fully justifies the amplifier's "ultra low-noise" title.

APERTURE CORRECTION RESOLUTION GAMMA

For comments on these parameters, see the relevant paragraphs in the earlier article. Because of the more sophisticated compensation arrangements, this circuit can be expected to produce a higher resolution figure — about 550 to 600 TV lines. However, as explained in the first article, the ultimate resolution figure achieved depends upon a large number of variables, and in particular the quality of the display monitor.

FOOTNOTE:

The frequency compensation arrangements in this amplifier were based on the use of a commercial yoke assembly with a nominal value of stray capacitance between the target connection and earth. Clif Danforth, VK7CD has built the amplifier, and reports that when he used a low capacity target connection, it was necessary to reduce the low frequency compensation network across the emitter resistor of Q5 to 470 pF and 200 ohms. If necessary, the values of these components should be altered until all smearing can be eliminated by adjustment of the "LF COMP" potentiometer. ■

QSP

73
The following comes from "Worldradio", March 1978.

"The traditional expression, '73', goes right to the beginning of the landline telegraph days. It is found in some of the earliest editions of the numerical codes, each with a different definition, but each with the same idea in mind — it indicated that the end, or signature, was coming up. But there is no data to prove that any of these were used."

The first authentic use of 73 is in the publication "The National Telegraph Review and Operator's Guide", first published in April 1957. At that time 73 meant 'My love to you'. Succeeding issues of this publication continued to use this definition of the term. Curiously enough, some of the other numerals used have the same definition now that they had then, but within a short time the use of 73 began to change.

In 'The National Telegraph Convention' the numeral was changed from the Valentine-type sentiment to a vague sign of fraternalism. Here 73 was a greeting, a friendly 'word' between operators and it was used in all countries. In 1859 the American Union Company set the standard '92 Code'. A list of numerals from one to 92 was compiled to indicate a series of prepared phrases for use by the operators on the wires. Here, in the '92 Code', 73 changes from a fraternal sign to a very flowery 'accept my compliments', which was in keeping with the florid language of that era.

Over the years from 1859 to 1900 the many manuals of telegraphy show variations of that meaning. Dodge's 'The Telegraph Instructor' shows it as merely 'compliments'. The 'Twentieth Century Manual of Railway and Commercial Telegraphy' defines it in two ways, one listing as 'my compliments to you', but in the glossary of abbreviations it is merely 'compliments'. Theodore Edison's 'Telegraph Self-Taught' shows a return to 'accept my compliments'.

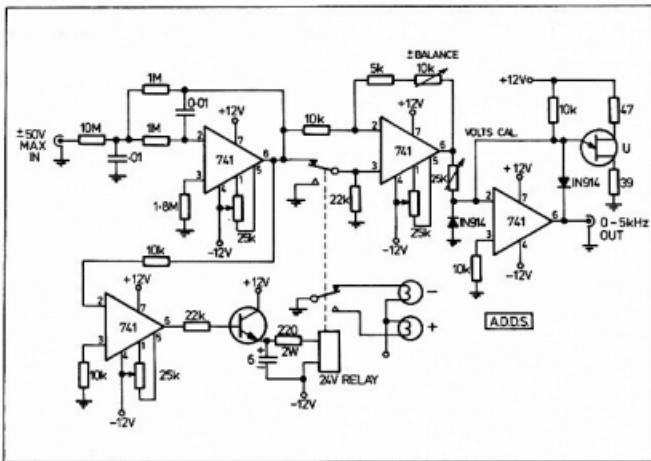
TRY THIS

WITH THE
TECHNICAL EDITORS

DVM ADAPTOR FOR FREQUENCY COUNTER

This circuit is from "Master Handbook of 1001 Practical Electronic Circuits", edited by Kendall Webster Sessions. The three

25k potentiometers are used to set the 741 outputs to ohm volts. U is a unijunction transistor such as a 2N4853 or a 2N1671. ■



By 1906, however, a later edition of the Dodge "Manual" gives us today's definition of "best regards", with a backward look at the older meaning in another part of the book where it is also listed as "compliments".

"Best regards" has remained ever since as the "put-it-down-in-black-and-white" meaning of 73, but it has acquired overtones of much warmer meaning. Today, amateurs use it more in the manner that James Reid had intended that it be used — a "friendly word between operators"."

HITCH HIKING

With his finger (or scorn?) a hitch hiker says, "You furnish the car, petrol, attend to the repairs and upkeep, pay the insurance and I'll ride with you. But if you have an accident I'll sue you for damages." Maybe he'll bash your head in if you don't keep alert. Thus you would lose your car as well. How many members in organizations are hitch hikers or drivers? Adopted from "Worldradio", March 1978.

AMATEUR EXAMS

"Candidates apparently do not read the questions carefully and therefore do not understand what the examiner really requires."

This quotation is taken from a letter, published in Radio ZS, from the Postmaster-General to the SARL on the results obtained from a recent exam in South Africa. The letter goes on to give further details of candidates' results.

The problem is not unique and local candidates would be well advised to read the question thoroughly before attempting the answer.

NEW ZEALAND REPEATERS

"Ten years ago people would not have believed that there would be 25 FM repeaters operational in New Zealand by mid-1977. This number includes the one 70 cm repeater (Channel Q at Wellington) and is in addition to the 8 AM repeaters operational in the South Island. With an average of one repeater for every 130 amateurs, New Zealand ranks among one of the most 'Repeaterised' countries in the world." Article in "Break In", November 1977.

2m EQUIPMENT

Reports coming through from Europe indicate that the 144-148 MHz segment of the spectrum is being used in the Middle East for military traffic. One report states that many thousands of unmodulated hand portable and fixed stations have been sold to Middle East countries for use in this band. "Radio Communication" April 1978.

GOT PROBLEMS?

Nov. '77 QST quotes a local club bulletin which describes how one prospective amateur is learning code and theory from club members. The 20-year-old student was injured in a fall and is almost completely paralysed. He has to learn code with a special machine attached to his chin and sends it with his tongue.

NEW PREFIX

According to "Radio Communication", April 1978, the prefix series J2A-J2Z has been provisionally allocated by the ITU to the Republic of Djibouti, the 154th member of the ITU.

FEES DIFFERENTIALS

"The effectiveness of the self-discipline of the amateur service was officially recognized in the Federal German parliamentary question hour on 10 November 1977. In answer to a question from the West Berlin deputy as to the reason for the difference in the monthly fees for amateur radio stations (DM3) and for CB fixed stations (DM15), the Parliamentary Secretary of State replied: 'The effort required on the part of the FRG Post Office for the licensing and supervision of amateur radio stations is considerably less than that for low power CB fixed stations. In contrast to these CB stations, amateur stations may only be operated by persons who have passed an examination, the standard and level of which are determined by international regulations; this means that the effort and outlay of the Post Office for monitoring purposes are considerably reduced.'" "Radio Communication", April 1978.

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ICOM model IC-211	\$ 785	Emotor.
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YAESU MUSEN model FL-2100-B Lineal Ampl.	\$ 569	300 Mast Stay bearing for above
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AN AR SPECIAL: EQUIPMENT REVIEW — THE ICOM IC22S

The ICOM IC-22S is the latest in the ICOM 22 series to be marketed in this country by VICOM of Melbourne. The 22's have built up an enviable reputation in the two metre FM field over the years probably due to several very good reasons. Firstly they have been usually available from stock or at the worst on very short order. Secondly there has always been a good supply of crystals available for the various repeater and simplex channels, and last but perhaps the most important, they have proved to be highly reliable in service. If, however, trouble did occur, VICOM always had the required spare parts and expertise to put things right.

The 22S is fully synthesized. That is, unlike its earlier relations, it does not require a set of crystals for each channel. In place of the crystal board is a diode matrix board with the capability of programming 22 channels. As supplied, it is set up for repeaters one to eight and simplex channels 40, 50 and 51. Appearance is almost identical to the earlier IC-22A. The colour has been changed from jet black to a dark charcoal grey and a duplex A, duplex B, simplex switch has been added.

The addition of the frequency synthesizer has added to the complexity of the unit to a marked degree. The original 22 had 23 transistors, 3 FETs, 3 ICs and 16 diodes, where the new 225 has 34 transistors, 7 FETs, 13 ICs and up to 128 diodes. Most of the additional components are required for the new frequency determining section.

Most of the general specifications for the 22S are the same as the earlier models, but it is interesting to see that the spurious output of the transmitter is now a specified item at -60 dB down on carrier level.

Even with all of the new circuitry the overall current drain from a 13.8 volt source is still the same at 2 amps on transmit and 400 mA on receive when squelched.

One new feature is the addition of a substantial heat sink at the rear for the final output transistor, another is some positive high SWR protection in the form of an SWR detector in the final output circuit and an amplifier to provide cut-off for an earlier stage.

The IC-22S sold here in Australia is set up so that channels can be programmed at 25 kHz intervals. However, other versions are produced in Japan to suit both the American and European channel spacing plans. The English version is known as the IC-240.

IC-22S CIRCUIT DESCRIPTION

In general the 22S is similar to the earliest models and readers are referred to the

review of the IC-22 in the December 1974 issue of Amateur Radio. Perhaps the most significant change in the receiver section is the new ceramic discriminator. This will provide better long term stability. The receiver RF stage is still a 3SK40 and the first mixer has been changed from a single gate FET over to the dual gate 3SK40. In practice no difference in performance was detected but cross modulation characteristics should be slightly better. The transmitter starts off at 10.7 MHz and this is mixed with the output of the synthesizer to produce the required output frequency. The same synthesizer frequency is fed to the receiver first mixer to produce the first receiver IF of 10.7 MHz. Diode switching is used throughout as with the earlier models, hence there is no audible click when changing from transmit to receive or vice versa.

THE 22S ON THE AIR

It took a little while to get used to the operation of the duplex/simplex switching. There is no indication of duplex operation other than the position of the switch. It is hard to understand why an LED indicator was not included to give a warning. However, once mastered operation became very simple and by using the facilities provided by this switch some unexpected operating features were found. When working on a repeater it is possible to switch to reverse so that transmit and received frequencies are changed over. This enables one to check other stations working into the repeater to see if simplex operation is possible. This also means that repeater channels not in use in the area

can be used for simplex contacts. Taking this one stage further, a repeater input frequency can be used for simplex operation without using the transmitter offset at all.

In all, it was difficult to pick the difference between the 22S and a 22A that happened to be in the shack at the time. Although the 22S uses a smaller loudspeaker than the 22 or 22A, no difference could be detected in the received audio quality.

Full details are included on the methods of programming additional channels and plenty of spare diodes are included within the transceiver. It appears that an accurate match is needed for the transmitter output. We found that if the SWR exceeded 2:1 when operating in the low power (1 watt) position that an audio howl appeared on the transmitted signal. It also seems that after some 22s have been operating for a long period of time, they are subject to a slight drift higher in frequency. Some units have been noted to shift up to 3 kHz. It should be noted that this only appears in isolated instances and this amount of shift is not serious.

THE IC-22S ON TEST

A few quick checks were carried out to see if the unit was up to spec. It was. Transmitter output was measured on a Horwood power meter. It was 11.5 watts in the high power position and 0.75 watts in the low power position. On receive the mute opened at .2uV, an excellent figure.

INSTRUCTION MANUAL

The manual provides most of the information

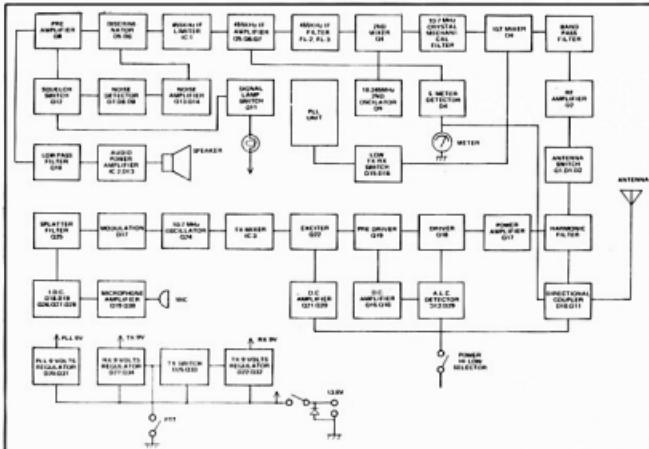
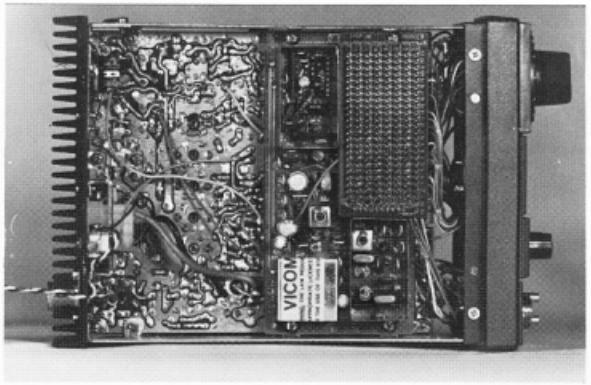


FIGURE 1: IC328 Block Diagram



tion needed. The operation aspect is well covered and clear photos indicate most points that could require adjustment. A large scale circuit diagram is included which is a great improvement over the miniaturised version in the earlier books. Also new is a complete voltage chart for both transmit and receive conditions.

At the current list price of \$279.00, the 22S represents excellent value. Considering the channel capability it is actually cheaper than the model it supersedes and as sales have proved, it appears to be the way most amateurs want to go.

Our test unit was supplied by VICOM International, to whom all enquiries for the IC-22S should be directed. ■

The Versatile IC22S with cover removed showing programming board.
(Photo by Reg Goudge)

1978 FEDERAL CONVENTION — PICTORIAL ROUND-UP



The Perpetual Remembrance Day Trophy.



Ian Hunt (left) VK5QX and David Wardlaw VK3ADW, present the RD Trophy to Ted Howell VK1DH.



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1.15 a.m. — RELAXATION!!

GOODWILL THROUGH INTERNATIONAL AMATEUR RADIO

A recent visitor to Australia, Captain Tanongsuk Tuvinun of the Royal Thai Army, spent several months working with a Defence Establishment in Adelaide. Whilst not at this stage an amateur operator, but showing signs of becoming such, Captain Tuvinun, called Tanong for short, when back in Thailand has as one of his senior officers HS1JN Jumpong Sowanna, who is an Admiral in the Royal Thai Navy, and also a member of the Royal Thai Amateur Radio Society.

When Tanong arrived in Adelaide he found that he was working with Ian VK5QX and the amateur radio connection soon became known.

Needless to say, it was not too long before Ian had Tanong on the air talking back to Bangkok and several contacts were made with Kam HS1WR, who is the President of the Royal Thai ARS and a Colonel in the Thai Army. Contact was also made under these circumstances with Hans HS1BG, who is a Vice-President of the Society.

These links having been established and the bonds of friendship woven, it was thought by the Council of the South Aus-

tralian Division that some further gesture of friendship would be desirable and in order.

Tanong had told Ian VK5QX that reference books in Thailand were both difficult to obtain and quite expensive.

The VK5 Division Council decided to ask Tanong to take back to Thailand on behalf of the Division a set of books to be presented to the Royal Thai ARS.

These books were presented to Tanong by Ian VK5QX as Vice-President of the Division. As shown in the cover photograph, the presentation was witnessed by Bob Edgar VK5RS and Ron Catmur VK5FY, both of whom worked in the same area as Tanong and Ian.

The books presented comprised both Volumes 1 and 2 of the RSGB Handbook, the RSGB VHF/UHF Manual, the ARRL Antenna Handbook and an American handbook on VHF/UHF Antennas.

It is hoped that the provision of these books may in some small way contribute to the advancement of Amateur Radio in Thailand and serve as a useful reference for members of the Amateur Radio Society in that country.

Ian VK5QX. ■

COMMERCIAL KINKS

With Ron Fisher VK3OM
3 Fairview Avenue,
Glen Waverley 3150

The Realistic DX-160 was discussed in this column quite some time ago in general terms. A letter recently from Mr. A. Ward VK4WK suggested a few simple modifications for the receiver. It is claimed that they result in improved stability and better SSB resolution.

(1) To improve the ripple content of the built in AC power supply. Break the lead from the output side of SW 11.2 to the .5 amp fuse. Now wire in a small low resistance LF choke. The secondary of an old speaker transformer is ideal, however the resistance should be no more than one ohm (suitable LT filter chokes are available). One end of the winding should go to the switch and one to the fuse holder. A small voltage will occur (.5 volt) but this did not affect performance. The modification resulted in improved SSB reception on 21 MHz and higher.

(2) The next modification was to isolate the BFO from the HF oscillator and provide it with its own stabilised supply. Disconnect SW 10 : 1 from the point where it connects to the positive point of Zener diode D7. Connect a 5.1 volt Zener across C48 to earth. Reconnect SW 10 : 1 to the 10.2 positive line via a 500 ohm 1/4 watt resistor. This modification provides better BFO regulation with improved SSB and CW resolution.

(3) This modification applies to the band spread system. Due to the design of the tuning system and the coupling between stages, the receiver goes slightly out of trim during the rotation of the band spread dial towards the high frequency end. The remedy is to connect a padder capacitor in series. A value of about 16 times the maximum of the band spread capacitor is suggested.

Apparently quite a few of these sets come misaligned on band "E". Check and make sure that yours isn't lined up on the image rather than the required signal.

Our thanks to VK4WK for his ideas. Next month a few simple modifications for the TS-520. ■

RATBAG CBERS ON RAMPAGE

Events of 29 April to 2 May at Greystanes
(From a deposition by VK2BPP and details from WIA N.S.W. Division)

Having been enjoying a pleasant Saturday out with family and friends, Bruce Pinkerton VK2BPP returned home about 23.30 hours to be met by his next door neighbour with the advice to get the family into the house quickly to avoid trouble. A group of CBers had left a petition under Bruce's front door about 20.30 hours.

Earlier in the evening, the neighbour said, he had been confronted by two groups of CBers, some 35 to 40 in number. The last confrontation was shortly after 20.00 hours, when he had been threatened. They made a demand to know VK2BPP's whereabouts and to pass on the message that if a device jamming their channel was not switched off in an hour they would damage VK2BPP's aerial installations. The neighbour also said that members of the group had been in the back yard and on the roof and he had tried to disperse them.

VK2BPP, having obtained a torch, then saw the damage done to his Oscar satellite tracking, VHF/UHF and HF aerial systems, the coax and control cables cut and whole sections removed. It was then that a group of CBers began forming in his driveway, some apparently drunk. Upon sight them Bruce asked why, and who was responsible for the damage. Observing aggressiveness, he telephoned the police who arrived about 23.45 hours and the group dispersed. He then found all his house fuses had been removed and both his and his neighbour's gardens severely trampled. Telephone harassment then began.

Another group of CBers arrived about 00.30 hours and around 04.15 hours empty cans were thrown into the garden and at the house. At one stage there were over 80 cans in the street.

On Sunday, Bruce was visited by a friend to whom he had been giving help towards his AOCP instruction. The friend told him that the jamming device operated a "beep-beep" signal on 27.155 MHz from dusk to dawn using light switches out of DMR roadworks warning lanterns. Other similar devices had been previously located in the area and discovered by two CBers. A listening post was then set up and logged the commencement of the interference at 17.15 hours. From 18.00 hours CBers began driving up and down the street but when the police arrived a little later they had all gone. At 20.45 hours a party of two CBers and three nearby amateurs went off on foot to search for the device which, it is understood, was found in a tree some 250 metres away.

Another threatening telephone call came in at 01.00 hours on Tuesday morning and it was later that the loss of his 2 metre mobile whip was discovered. ■



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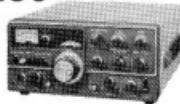
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YAESU FT101E
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TS-520, TS-820

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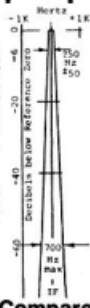
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- A large-sized LED, digital display system provides readings up to six figures
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\$259.00

VHF ANTENNAS:

HUSTLER: G6-144A, 6 dB gain base colinear.

HUSTLER: CGT-144, 5.2 dB gain mobile colinear trunk-lip mt.
HUSTLER: BBLT-144, 5/8 mobile with trunk lip mount/spring

CUSHCRAFT: RINGO ARX-2

CUSHCRAFT: A147-20T, 20 element twist.

CUSHCRAFT: A144-11 11 element

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DENTRON RADIO CO.: MLA-2500, 160-10m linear amplifier.

DENTRON RADIO CO.: MLA-1200 — 80-10m linear amplifier.

DENTRON RADIO: 160-10L Superamp, 160-10m linear amplifier.

ANTENNA TUNERS:

DENTRON MT-3000A DENTRON 160-10AT DENTRON 80-10AT

The MT-200A

The DenTron MT-200A antenna tuner, an economical full power tuner designed to handle virtually any type of antenna matching problem. It's very compact, quiet and of all-wire. The sleek styling and low profile of the MT-200A is certainly beautiful, but be assured that isn't all you're buying. The MT-200A is designed and engineered using heavy duty all-metal casings and high quality American components throughout. While it has all the MT-200A's unique features, front panel coax bypass switch, front panel lighting protection antenna grounding switch, 3 kW PEP handling capability and built-in 3 core balun for balanced feed line, we're sure you'll decide to buy American and stay with DenTron.



\$269.50

The Jr. MONITOR \$103.50

Call it what you will — antenna tuner, transmatch, matchbox, or matching network, the JR. MONITOR has it all. It's a compact, rugged, 1/2 w. x 10 h. x 6 d. of all metal cabinet. Think of the unlimited possibilities you'll have for experimenting with dozens of antennas! For instance, the DenTron All Band Doublet fed with multi-feed line hooked to the JR. MONITOR covers 1.8-30 MHz. You can try this with a 100 ft. 1/2 in. mobile whip fed with coax to the JR. MONITOR located under the dash will give you 10-40 metre coverage and no coils to change! Order Today.



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New Model 75 RTTY TO VIDEO CONVERTER

Features:

- 4 speeds (60, 66, 75, 100 wpm)
- Built-in T.U. with 3 shifts (170, 425, 850 Hz)
- 32 character x 16 line video output with scrolling
- Connects directly to receiver audio & video monitor



\$448.00

New Model 150 RTTY KEYBOARD

Features:

- 4 speeds (60, 66, 75, 100 wpm)
- Built-in AFSK with 3 shifts (170, 425, 850 Hz)
- Automatic CR & LF at end of 64 or 72 character line
- Built-in low shift CW ID provision

CUSHCRAFT ATB-34

10, 15, 20 meter antenna.

Price: \$289.00



ANNOUNCING NEW INFO-TECH MODEL 200!

A complete system that converts Morse, RTTY and ASCII to Video, using Fairchild F-8 Microprocessor Technology! A good receiver and video monitor are all that is required!

NEW Model DX-555 Counter-Generator

Generator:

440 kHz to 30 MHz in 3 ranges. Output displayed on counter and available at jack on rear panel. 600 Hz modulation for AM receivers.

Counter:

5 digit display, 7 digit readout capability, 10 Hz to over 30 MHz (250 MHz with prescaler). Input level 200 microamps to 5 V. ns (Prescaler 2000:1 to 2 Vrms). Base oscillator beats directly against WWV.

NEW COUNTER-GENERATOR

Two vital pieces of test equipment in one.



A Unique New SSB/CW Transceiver For Amateur Communications, at \$1990

There is no substitute for quality, performance, or the satisfaction of owning the very best. Hence, the incomparable National RJX-1011 amateur transceiver. The RJX-1011 covers all amateur bands 1.8-30 MHz (160-10 metres). It utilizes advanced Phase-Lock-Loop circuitry with dual gate MOS FETs at all critical RF amplifier and mixer stages. There's a rotating dial for easy band-scanning and an electronic frequency counter with digital readout and a memory display that remembers frequencies at the flip of a switch. And that's just the beginning. Matching speaker unit RJX-S1011 and complete external VFO RJX-V1011 also available. For further information and specifications write, phone or call in!

LINEAR AMPLIFIERS

SCS: HF3-100L2, 3-30 MHz bi-linear amplifier. **\$245.00.**

SCS: 2M10-80L2, 144-148 MHz, FM/SSB linear amplifier. **\$259.**

METRON: MA1000, all solid state, 1 kW amateur band linear amplifier — lightweight, compact and rugged.

YAESU MUSEN: FL-2100B, 80-10m linear amplifier.

ANTENNAS:

HUSTLER: 4-BTV — vertical trap antenna, with 80m resonator. **\$130.00.**

HUSTLER: Mobile vertical trap antenna (80-10m). **P.O.A.**

CUSHCRAFT: ATB-34, 4 element beam, 10-15-20m. **\$289.00.**

WILSON'S SYSTEM ONE: TRIBAND ANTENNA — A DXer's delight, operating 20 m on a full 26 ft. boom with 4 elements on 20-15, and 5 elements on 10. Gain 10 dB! **\$339.00.**

RF PREAMPLIFIERS FOR 3-30 MHz BAND:

Model SX-59 for use with transceivers.

SPECIFICATIONS:

Frequency range 3-30 MHz in 3 bands;
3-7, 7-14, 14-30 MHz
Gain 20 dB nom. (at 7 MHz), front panel variable control
Attenuator —20 dB attenuation selectable from front panel control.
Imped. 50 or 70 ohm systems, UHF connectors on rear panel.
Switching requirements: requires external relay contact switching when used with transceivers. Remote contacts readily available from most amateur HF transceivers, including TS-510, TS-511, TS-520, TS-820, FT-101, FT-401, FT-200 and FT-201.



\$84.00

AMATEUR BAND TRANSCEIVERS:

NEW — NATIONAL: RJX1011 — Unique SSB/CW 160-10m transceiver with digital readout and matching speaker and external VFO.

TRIO KENWOOD: TS520S — SSB/CW, 160-10 metres, with optional digital readout.

TRIO KENWOOD: TS820S, 160-10 metres digital readout.

TRIO KENWOOD: TS820, 160-10 metres

TRIO KENWOOD: TS700A — 144-148 MHz all mode transceiver.

TRIO KENWOOD: TS600A — 50-54 MHz all mode transceiver.

TRIO KENWOOD: TR-7400A — 144-148 MHz FM transceiver.

YAESU MUSEN: FT101E — 160-10 metres, AM, SSB, CW transceiver.

YAESU MUSEN: FT301 series, 160-10m AM, SSB, CW transceiver.

RECEIVERS:



DRAKE: SS-1 Wadley Loop receiver.

TRIO KENWOOD: R300 general coverage BCL receiver.

YAESU MUSEN: FRG-7 general coverage Rx, Wadley Loop System.

NATIONAL: DR48 (RF4800) — general coverage, digital dial, communications and BCL receiver.

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WOOMERA AMATEUR RADIO CLUB – FIELD DAY ACTIVITY

ABOUT THE CLUB

Of the eight club members licensed, three are Americans. The club (possibly the only one in Australia) has an operating roster, i.e. one week in eight you can operate from

your home. The club equipment can be used any time.

The club has recently purchased equipment to operate Mode "A" through the

Oscar satellites.

We were given a 50 per cent subsidy by the Woomera Board (equivalent of Local Government). ■



John Nankervis VK5OJ and wife Carol, replenishing refreshments(?)



Dick Menz VK5OL and YL Gabrielle Chlebeck of Andrew VK5ZWO.

WARC '79 FUND RAISING BY ILLAWARRA ARS

The Illawarra Amateur Radio Society of Wollongong, N.S.W., during the latter part of 1977, took up the challenge to raise funds towards the WIA participation in WARC '79.

A raffle was conducted and the net proceeds amounted to \$400.

Picture shows Tim Mills (left) VK2ZTM, the President of the N.S.W. Division of the WIA, receiving a cheque for \$400 from Brian Boseley VK2BCI, Secretary of the

Illawarra Amateur Radio Society, at the Society's monthly meeting for April 1978.

On accepting the cheque, Tim thanked the members of IARS for their initiative, and in particular thanks to John Hodkinson VK2BHO, who conducted the raffle.

Tim, in an address to the meeting, spoke of the importance of WARC '79 to all amateurs and also the role that the WIA plays in serving the interests of amateurs generally.

(Information from Ian Bowmaker VK2ZJA.) ■

QSP

MARIS
MALTESE AMATEUR RADIO INTERNATIONAL
SOCIETY

The MARIS is a society of members whose interests are radio experiments and communications. It is world wide.

The headquarters of the society is in Canada, and its Director is George MUSCAT (VE5GNM). There is a branch of the society in Australia, and the Director is Paul Muscat (VK5PQ), located in South Australia.

To be a member of the society you have to be of Maltese origin or married to a Maltese person. You also have to be a licensed amateur radio operator of any class.

For further information please contact one of the following members:

Len Pearson (VK5NNU), 7 Damien Avenue, West Wonthaggi, NSW 2145; Sam Galea (VK2NOG), 57 Fairview Road, Carley Vale, NSW 2166. ■

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Switchboard Op.: "Good morning. Can I help you?" Voice: "Yes please. I am inquiring about zener diodes."

Switchboard Op. (after pause): "I'm sorry, Sir, but Mr. Diodes doesn't work here any more." ■

G2NM

The call sign G2NM, which belonged to the late Gerald Marcus, is very well known to old-timers. News from the Chichester and District ARC is that G2NM has been issued as a commemorative call for use on 24th-25th June to enable old-timers to repeat contacts made by the late G2NM. ■

CONTESTS

Kevin Phillips, VK3AUQ
Box 87, East Melbourne, 3002

RD CONTEST 1978 – RULES

The Remembrance Day Contest Rules for the 1978 Contest will be published in the July issue of AR. The contest will be held on Saturday 12th and Sunday 13th of August.

CONTEST CALENDAR

May 27-June 4 Townsville Pacific Festival Contest June

2/5	CHC/FHC/HTH QSO Party
17/18	West Virginia QSO Party
17/18	All Asian Phone
18	WAB LF CW Contest

July	1/2 Venezuelan Phone Contest
	Radiosport Competition
	Ten-Ten Net QSO Party
15/16	Sunshine State – Jack Files Memorial
15/16	(VK4 only)

22/24	Rhode Island QSO Party
29/30	Venezuelan CW Contest
29/31	Country Hunters CW Contest

August	REMEMBRANCE DAY CONTEST 1978
12/13	SARTC RTTY Contest
19/20	All Asian CW Contest

September	Scandinavian Activity Contest CW
19/17	Scandinavian Activity Contest Phone

October	CQ WW Phone Contest
28/29	CQ WW DX CW Contest

November 25-26 CQ WW DX CW Contest

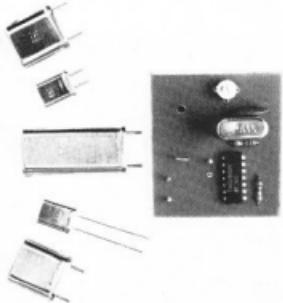


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TEN-TEC



SPECIFICATIONS

GENERAL

Frequency bands: 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5, 28.0-28.5, 28.5-29.0, 29.0-29.5, 29.5-30.0 MHz. Ten meter crystals furnished for 28.0-29.0 MHz. All circuits permeability tuned. Tuning vernier 25 kHz per revolution, typical. 9 MHz i-f filter, 8 pole crystal lattice. Direct frequency readout: [Model 540 — slide rule, color coded dial indicates 100 kHz segment, dial skirt increment to 1 kHz. Accuracy ± 1 kHz from nearest 25 kHz calibration point. 25 kHz pulsed calibrator. Model 544 — six digit, 0.43" high LED numerals. Least significant digit indicating 100 Hz green, all others red. Accuracy ± 100 Hz. No calibrator in this model.] Automatic sideband selection, reversible. VFO frequency stability: Less than 15 Hz change per F², averaged over a 40° change from 70° to 110°, after 30 minute warmup. Less than 10 Hz change from 200 to 240 VAC line voltage when using TEN-TEC power supply. Power required: [Model 540 — 12-14 VDC, 500 mA receive, 18 A maximum transmit. Model 544 — 12-14 VDC, 1 A receive, 18.5 A maximum transmit.] Modular construction: [Model 540 — 10 plug-in assemblies and 7 fixed circuit boards. Model 544 — 10 plug-in assemblies and 9 fixed circuit boards.] Semiconductors: [Model 540 — 47 transistors, 33 diodes, 11 ICs. Model 544 — 65 transistors, 38 diodes, 14 ICs, 1 LSI, 6 LED displays.] Power switch remotely controls

power supply. Snap-up front feet. Construction: Rigid aluminum chassis, sub-panels, top and bottom. Cyclocal plastic side panels. Finish: Etched aluminum panel, textured black top and sides. Size 4½" x 13" x 13". Net weight: 12 lbs.

RECEIVER

Mosfet rf amplifier. Preselector resonant control. 0.3 uV for 10 dB S+N/N. 2.6 kHz band width, 1.8 shape factor at 6/60 dB points. AGC controlled by rf gain control. Meter automatically switched to "S" meter when receiving. Offset tuning with defeat switch and LED indicator. Built-in speaker in bottom. External speaker/phone jack. Less than 2% audio distortion. WWV reception at 10 and 15 MHz. CW filter (optional), 150 Hz wide, two positions, shape factor 7.2 @ 6/60 dB.

TRANSMITTER

200 watts input, ssb and cw. 100% duty cycle. Instant band change, no tune-up required. 8 pole ssb filter. Automatic Level Control on front panel. LED indicator shows operation in ALC region. Cw sidetone fed into audio amplifier when in cw mode. Sidetone adjustable for tone and volume. Automatic cw offset of 750 Hz. Press-to-talk. Meter indicates SWR when transmitting. High impedance microphone input. RF output impedance 50-75 ohms, unbalanced.



PLEASE PHONE, CALL OR WRITE, FOR FURTHER PARTICULARS OF THE TEN-TEC RANGE

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

February 8th, 1978.

The Editor,

Dear Sir,

After finally getting on the air again I was pleased to find activity on 160 metres over the 28/29 January week-end. Heard between 0830-1400 BMT were KDRF, K5MA, W5YU, K7NN, K6SE, NDXB, KH5CC, ZLTMQ, VK3IM, VK6HD, VK5KO, VK4XA, VK411, and dozens of JAs. My serial was an 80 Inv-vee to a Codan antenna tuner. Six metres had a few openings while I was at home.

14-12-77 — 0845 to 0900 GMT — VK8ZCJ, VK8VW.

7-1-78 — 1015 to 1115 GMT — VK4Ks: DO, ZTV, GM, ZWB, DV in Rockhampton area; VK4s: ZBC, ZBU, FW in Brisbane area and VK2ZDY.

15-1-78 — 0100 to 0115 GMT — VK4ZBC, ZEC in Brisbane area.

20-1-78 — 0900 to 1100 GMT — VK2s: ZNS, ZPP, ZAY, ZIO, HO, ZVL; VK4s: ZIL, ZWH, LE and VK1RK.

29-1-78 — 0500 to 0530 GMT — Asian language SSB on 49.980 MHz. Signal peaked at beam heading of NW at 5 x 5.

I wish to pass my best wishes to all past ham friends and wish to let them know that I'm back on the air from Clifton Beach (20 km north of Caloundra) on all bands 160-2m using a TTS205/TVS506/IC228 using various aerials.

Previous calls: K6CAA, K5COU, KHEGLU, KX6KB, VK3ND, VK4ABA, VSSA, VR3DY, FW8DY, 5W1AF, and operator at 9M6AB. I still have logs and QSLs from most operations and anyone who worked me under any of those calls can still get a QSL.

Ed DeYoung VK4LK, Box 2058, Cairns. ■

7/4/78.

The Editor,

Dear Sir,

Instead of the "DX and You" column why don't you rename it DX and ME. The person you picked to write that column has about as much appeal as a Sunday "seaside".

He has used the column as a soap box to expound his own inability to relate to the amateur hobby of Amateur Radio. I can imagine a new licensee reading that in an effort to find out how the experts get to work the rare DX countries, and heading straight back to stamp collecting. Sir, you do the hobby a disservice by allowing said gentleman to rave on about the virtues of rag chewing and chewing the fat with a mate in Kilowatt Alley, California, or 20 metres.

I find myself wondering what would have happened when I was logged in by the Clipperton Operator, had I commenced yarning on about my iron-grown-to-nail, my wife's green tomato relish and the new beauty box I just bought for \$1.00 which enables me to work Joe on Channel 40 FM.

OK, we are all entitled to our personal approach to our hobby, but I am sick and tired of hearing of people such as the author of your DX column using the airwaves to ram home the point that they aren't turned on by that sort of thing.

I am offended by his attitude and think that the column DX and YOU is just what it says. An introduction to where it's at and how to get that rare station. This could be of great use to a newcomer.

His attitude to QSLing confirms what I have often suspected of some Australian Amateurs, especially from Norfolk Island. Hundreds of dollars in ICR coupons and mail have been spent by overseas Amateurs in pursuit of various awards for achievement in DX. Commercial as it may seem, it is the only way to get some confirmations of countries, especially rare ones. Our friend here seems to be one of those with waste paper baskets overflowing with cards which some unfortunate

have sent to him. I can imagine the frustration of the Amateur who had the misfortune to get him as a "first VK OM" waiting five years for that card which will never return.

Even the formality of writing CPM and signing it on the back of the DX station's card would be a little better than the Inclinator.

I realise you need space for other contributors so I'll enclose in a fairly famous statement.

"The final courtesy of a QSO is a QSL."

There are no time limits on QSOs or in fact what constitutes a QSO. I hope I never meet the author on a six metre TEP opening where there is maybe two or three minutes to exchange necessary QSL information.

If your column insists on using the space to expound the virtues of the author may I suggest you scrap it again or use it for some other good cause.

Yours faithfully,
Stephen R. Gregory VK3OT. ■

56 Coleman Street,
Wagga Wagga 2650.

The Editor,

8th April, 1978.

Dear Sir,

I noted with interest that the Department of Posts and Telecommunications has granted combined CB and Novice Licences for \$25 — no doubt as a minimal form of compensation to the Amateur Service for the "rape of 11 metres".

I point out that there are some FULL AOCP and "Z" call amateur operators who are engaged in training and encouraging CBers to up-grade to Novice — and higher qualifications, who, in order to perform this function, pay the \$12 for their amateur "tickets" and \$25 for the privilege of talking to CBers in order to spread the good news of amateur radio. There are not very many of us in this area and, I suggest, it would not be unreasonable to suggest that a similar "Combined CB and Full Licence" fee should be made available at least on the same terms as for the Novices. While we may not be making much of an impact on the hordes of CBers (licensed and unlicensed) who now occupy the 11 metre band, at least we ARE making an effort that will incidentally reduce the problems faced by unqualified, non-technical users of the 27 MHz area. To that extent, the Minister for Posts and Telecommunications could quite reasonably grant this concession. Accordingly, I request that this matter be given publicity via your valuable journal.

Yours faithfully,
Rex Black VK2YA.

Box 1513, G.P.O.,
Brisbane 4001.
16th March, 1978.

The Editor,

Dear Sir,

It's amazing! A retailer's advertising appears in AR (March, p. 35) announcing 5 element 11 metre beams!

What, buy one now, and be prepared for 1982 when the band reverts to the Amateur Service? or maybe the intended market is elsewhere (along with the featured FL-110 linear), notwithstanding that legislation forbids the use of high-gain antennas on 11 metres.

Yours faithfully,
Mervyn Eunson VK4GO. ■

3rd March, 1978.

The Secretary,
The Wireless Institute of Australia,

Dear Sir,

It gave me very great pleasure last week to receive your letter informing me of the award to me of the Alan Shawsmith Journalistic Award. Our hobby of Amateur Radio is one in which awards are much sought after, but always with the thought in mind that we may be lucky enough to top the score in the next contest or to finally gain that one-hundredth QSL for the DXCC. The thought that one of us can gain the distinction of a Journalistic Award had certainly never come to

my mind, making the receipt of the plaque (and the cheque) a complete and very pleasant surprise.

Would you please convey my sincere thanks to the Publications Committee and to Alan Shawsmith for selecting my contribution for this award. Without the happening of the Scout Jamboree and "The Field Station" there would not have been an article to write, so I must also say thanks to the large team who made the whole effort a success. In particular I should mention Bill Rose VK32MI, whose photographs contributed so much to the success of the article.

Yours sincerely,
Max Dawkins VK3TR ■

The Editor,
Dear Sir,

I would like to make a suggestion for a new Australian Award; currently there are very few certificates available to VK stations for any form of achievement within their own country. As a former Federal Awards Manager of the WIA, I am well aware of the interest shown in awards by VK stations and also the important role they play in helping to maintain activity on the bands. Those who were active during the period of the Cook Award in 1970 will undoubtedly remember the boost that gave to local activity. At the present time when our very bands are under considerable pressure from many quarters the more activity that can be promoted the better.

For many years the WAVKA (Worked All VK Call Areas Award) has enjoyed enormous popularity with overseas stations and remains virtually the only award issued by the WIA to overseas stations. For a DX station to achieve this award takes a very considerable effort and many operators often make comments to me that they are trying to get it. Some years ago a VHF version of the award was made available to VK stations and this too is a very worthy achievement as any VHF operator will tell you. To have any real meaning there must be some sense of achievement in attaining the requirements for an award. The WAVKA awards have this and to get either version takes a lot of operating. There is no value in an award that can be obtained in a very short time as it doesn't seriously promote activity or represent any definite achievement that is out of the ordinary.

What I would like to suggest is an award to be available to VK stations only for contacting all areas of Australia on a minimum of five (5) different bands. The requirements to be the same as those for present WAVKA award for each band, i.e. one station from VK1, three stations each from VK2, VK3, VK4, VK5, VK6 and VK7, one station each from VK8, VK9 and VK0. Operation to be on any authorised bands but the requirements to be met for stations as shown on each band, making a total of 110 confirmations in all. An application could be made for say 80, 40, 20, 15 and 10 metres or, say, 160, 20, 15, 10 and 6 metres, etc., as long as the five band requirement is maintained.

After many years of operating on a wide variety of bands I can assure you that such a requirement is sufficiently hard to be interesting but at the same time certainly not so hard as to be unobtainable. This is unfortunately pretty much the case with some of the overseas awards such as Five Band DXCC, etc., where due to our remoteness and different band allocations such as 80 and 40 metres puts local stations at a very severe disadvantage.

One requirement that would be necessary would be to retain the QSL card to prove contact. This is more necessary today than ever before as there are now many stations operating in our bands from within VK who are unlicensed and many operators could find themselves thinking they had an area worked when such may not be the case. By requiring QSL it is fair to all and no funny business can take place.

To help encourage Novice participation a section with a three band requirement could be allowed for 80, 15 and 10 metre operation. This would then make a version of the WAVKA award available to all licensees regardless of type. Any award obtained at a reduced licence level, i.e.

Novice or Limited, could count towards the full award at a later time, e.g. a Novice having obtained three bands with the Novice call would only have to get another two under the higher grade of licence to reach the same standing as a Full licence applicant.

Yours faithfully,
Geoff Wilson VK3AMK.

21st April, 1978.

The Editor,
Dear Sir,

The latest issue (April 1978) has two articles on aerobatics, and I found them both interesting in concept. However, I found a bit of trouble with both of them.

1. Arthur's (3LJ) article was well written and understandable. My problem was with dimensions. Figure 1 missed one basic dimension, although the text gave an approximate overall of 175 feet. The article also missed telling us whether the dimensions are to centres of traps or between traps. I know it is a matter of cut and try, but it is nice to know exactly what another chap had, and start from there.

2. Hans' (2AOU) article was not dissimilar to those published many years ago. I found it about as readable as the last one — i.e. very heavy going. Hans is obviously a very bright chap, and like a lot of technical writers, assumes his readers are just as bright. Unfortunately I'm not that bright. He's also given just enough information to whet the appetite and sell beams, but not enough for us home builders to easily reproduce one.

I have one other problem — regarding Contests. There is reference on occasions to "rules the same as last year". This was the case for this year's ARRL CW contest. However, I couldn't find the rules in last year's issues or even for several years back. I finished up not bothering, even though I really wanted to have a go at it. I've been in it many years ago, but didn't try to use the same system because contest rules change from year to year (e.g. RD). Is there some way in which you could have a very simple 4 line summary to each contest each year, giving—

Times
Scoring system
Exchange numbers each way
Address for sending logs.

I found the same frustration with the WPX. Now I know you have limited space, and you try very hard to actually do what I've suggested. What I'm asking is for a short summary of each contest. Alternatively, if rules are the same from year to year, give the date of AR when the previous rules were published.

Yours sincerely,
Bruce H. Bussenschut VK5OR.

Editor's Note—

1. Perhaps Arthur (VK3LJ) could write to me with the information requested and we shall publish it in due course.

2. Re contests — the matter has been given to the Federal Contest Manager.

The Editor,

Dear Sir,

It is with concern that I read the April 1978 edition of the magazine and find on page 19 an article entitled, "The N.S.W. RTTY Group", by S. E. Molen VK2SG.

Although the article contains some facts about the operation of the Wireless Institute of Australia, N.S.W. Division, RTTY Group, there are a number of incorrect statements.

The first is of the standards for speed and shift. The slant of the Group is that there are no standards at this time, laid down for amateur RTTY operation and members are free to utilise such standards as they wish, provided that they are within the P. and T. Department's regulations. Operation is currently being carried out in N.S.W. on both 45.45 baud and 50 baud Baudot and 110 baud ASCII with both 170 and 850 Hz shifts.

With regard to repeaters it is proposed that the Group will operate a RTTY repeater in the Sydney area in the near future. The Newcastle repeater will be operated by the Maitland Postal Institute Radio Club.

The other area of concern is that of the last paragraph's content. The Group is a group under the framework of the N.S.W. Division and as such members of the Group are required to be members of the WIA. The reasons for this are of course obvious although every assistance will be provided to anyone interested in RTTY if they contact the Group.

The Secretary of the Group is Phil Card VK2ZBX and mail can be sent to the Divisional address as indicated.

The author of this article is not a member of the WIA and it causes some concern that something can go to the extent of being actually published in the magazine without its content being verified with the Division concerned.

I would appreciate the checking of articles for publication that purport to represent the views of this Division be done with more care in future.

Ian Mackenzie,
Secretary, N.S.W. Division
Wireless Institute of Australia.

(The article referred to above was provided by the Publicity Officer of the N.S.W. RTTY Group. We therefore did not consider it necessary to check with anyone else as to the accuracy of the article. The standard quoted is a common International HF standard. Further, if an article is of interest to members of the WIA, we will publish it whether or not the author is a member of the WIA.—Ed.)

98 Heaslip Street,
Wollongong, N.S.W. 2500

The Editor,

15th April 1978

Dear Sir,

LET'S SET THE RECORD STRAIGHT ON AIDS TO PROPAGATION

In AR of April 1978 under the title — WIANEWS — Records VHF/UHF, a statement is made which requires comment on behalf of all EME experimenters, past, present and future.

The statement is — "All these contacts were direct without the use of satellites, repeaters, EME or other such aids".

Now look at the type of AID which provided the path to the moon and back at 70cm.

1. The path loss is over 260 dB.
2. There is typically a rapid, random fade over a 15 dB range (several times a second).
3. The AID (the moon) is moving in two dimensions when an azimuth-elevation mounting on the antenna is used, and it moves a distance equal to its diameter each 2 minutes.
4. The AID is $\frac{1}{2}$ degree in diameter, as seen from the earth.
5. The AID has a relatively low coefficient of reflection for radio signals.
6. The AID has to be located by astronomical calculations if the sky is cloudy.
7. Doppler frequency shift is present, often to an extent greater than the bandwidth of the receiving system, and it doesn't stay constant.
8. Polarisation of the signal varies by several full rotations over the path on many occasions.

Thus, to achieve echoes, let alone communication, using the moon as an AID, requires equipment, etc., which has to be of a standard much higher than that presently used for purely terrestrial-path contacts (on 70cm and above) — which rely heavily on the presence of AIDS such as the existence at the time of super-refraction ducting and other similar anomalous conditions of the refractive index. Such conditions may occur relatively infrequently over very long paths and when they do it's ON.

I am in no way detracting from the fine efforts, know-how and perseverance of those amateurs who choose to use the terrestrial path and who have achieved much longer than "normal" distance for contacts on VHF, UHF and SHF, but I'm afraid that, while, if any, of the equipment presently used in Australia for this work would have a hope of achieving anything like an echo from the moon on 70cm or on the higher frequency bands.

Let's face it, the EME path is just another communication path — albeit approximately $\frac{1}{2}$ million miles long — which is available for long distance contacts on the amateur bands of 50 MHz and above, and it may be used by amateurs wherever they are located and in any direction which they may so choose.

The EME path is not like using a Repeater or Satellite (an extra-terrestrial Repeater), as it is a much worse means of propagation of radio waves than the boundary of the duct, air mass boundary condition or anomalous refractive gradient which will successfully propagate similar frequency radio waves near the surface of the earth — but it will do so if one is prepared to develop the equipment and "know-how" to use it successfully.

After all what is so sacred about "direct" (how direct?) paths inside the ionosphere, and which employs AID such as reflections, forward scatter, etc., to achieve long distance communication (sometimes), when the frequency used has the unique property of being able to penetrate the ionosphere? Is there something infra-dig about using a quite natural (non-man-made) means of reflection outside the ionosphere rather than another means of reflection/refraction/forward scatter inside the ionosphere?

Is the use of knife-edge refractions from a mountain range infra-dig? After all, the moon is made up of mountains and earth (not super-refractive green cheese!) So what if you have to go about $\frac{1}{4}$ million miles to get there, first.

NOW LET'S GET DOWN TO "BRASS TACKS"

We amateurs are communicators — right? and one of our aims, particularly at VHF, UHF and SHF, is to make contacts over the greatest possible distance on the earth's surface (in any direction that we please). We can do this by two ways at present.

1. By relying on the use of natural phenomena to propagate the signal between the two points. This requires the station builder/operators at each end of the path to strive to develop their equipment and operating techniques to the utmost to exploit the chosen means of communication over the distance involved.

2. By relying on the use of artificial (man-made) aids, placed such that the path length is increased as much as possible in the desired direction. Amateurs desiring to use these artificial aids have firstly to construct or get someone else to construct the device chosen and then to place it in the best position (near a terrestrial or orbit (satellite) for the path in which they are interested, then, secondly, to construct (buy) suitable equipment and operate it in the required manner — to achieve communication over paths which are limited in length and direction by the type of device and its location in relation to that of the station.

Encouragement to advancement of amateurs in each of the above two methods of long distance communication at frequencies above 50 MHz differs in my view, because use of the first method relies totally on the abilities of the amateurs at each end of the path. Awards for achievement of the longest distance, or of a specified minimum distance, etc. (up to half of the earth's circumference!) is one way which may encourage these people.

When an artificial aid is chosen to be used (and why not, if it will meet the requirements of those involved), then those whose decision it is to construct and to locate the device may be assisted in various ways by other amateurs, including financial aid and then by utmost use (not abuse) of the device once it is functioning.

Over to you for comment! But don't put EME together with artificial aids to communication; it's just another way, made by nature, and using exactly the same sort of natural phenomena as any other way of getting to the desired point on the earth's surface. "You point your antenna horizontally or you point your antenna somewhat upwards", so what?

Lyle Patison VK3ALU.

P.S.: I would suggest that your comment not be along the lines that EME communication will not be successful if high power and tremendous antennas are used, on 70cm, at least. Just a random sample from a recent EME Newsletter —

"JABBOH worked VE7BBG on 3-12-77. JA9BOH used 5 yagis and 250 watts and VE7BBG uses one of the smaller size dishes. Since then significantly lower noise figure receive preamplifiers have been developed for general use." I don't want to give you the impression that EME communication is a pushover, it takes lots of time, effort and some know-how to become successful, but amateurs are supposed to be experimenters, or are they?

Editor's comment — Mmmmm — picky picky!! — no one has ever questioned the tremendous effort required for EME. Apologies for the non-use of the blue pencil in the item referred to.

I hope that the publishing of this letter in full helps to heal the wound caused and enlightens other amateurs in the challenge and rewards of EME. ■

Manawatu Branch NZART,
P.O. Box 1718,
Palmerston North

The Editor,
31st March, 1978

Dear Sir,
There appears to be some confusion as to the frequency of our six metre beacon. The following information is a summary of the three beacons maintained by the branch:

Location — Mt. Stewart; 175° 29' 10" E.
40° 12' 20" S.

Height — 135m ASL.

Mode — +800 Hz FSK, call sign "ZL2VHP" and carrier.

Radiation — horizontal polarisation, omnidirectional.

Frequency — 6 metres, 52.500 MHz; 2 metres, 145.250 MHz; 70 cm, 433.250 MHz.

The branch would appreciate reception reports and comments on any of the beacons. These should be addressed to:

VHF Beacons, P.O. Box 1718,
Palmerston North, New Zealand.

An application has been lodged for a second 6 metre beacon, this to be operated by the Upper Hutt Branch and located on Mt. Clime, which is about 30 miles NE of Wellington. Other details are not known at this stage.

H. N. Wiggins ZL2BFR, Beacon Trustee. ■

P.O. Box 22,
Halls Gap

The Editor,
26-4-78

Dear Sir,

May I bring your and your readers' attention to the planned introduction of a 100 kW channel 5A TV translator, to be located at Mt. Dundas in western Victoria. This, I believe, can be considered another coffin nail driven in to wrest the 2 metre band from our possession, and I'm told is only the start of a planned proliferation of channel 5A translators around Australia. Whether we be operating on the SSB or FM sections of this band, we must consider this action a threat to our occupancy of yet another VHF band.

The 432 MHz band is under threat and six metres is unusable in Brisbane and Melbourne, 220 MHz is just a sad memory to some, and 11 metres is our latest example of how tenuous our hold on any frequency is.

The possible interference to Oscar satellites, TVI and receiver front end problems will inevitably drive more and more operators from 2 metres and, with the commercials clamouring for more band space, 4 MHz of almost unoccupied spectrum will look very attractive.

With WARC '79 and other problems, we as amateurs must back the WIA as one, both with representations to our Government and financial help.

Please, whether you are a HF or VHF operator, the Wireless Institute of Australia needs all amateurs' support as the only recognised body representing our interests.

Yours faithfully,
Robert Wilkins VK3AUR,
(The message is only too clear.—Ed.) ■

The Editor.

18-4-1978

Dear Sir,
Would you please grant me space to reply to a letter in these columns by VK3SV regarding a previous letter of mine on the controversial G5RV antenna.

Except for the first paragraph in VK3SV's letter, it was most constructive. I would explain to VK3SV that I did not read the excellent articles in AR 1974 for the amateurs concerned, because at that time I was busy putting together one of the country's most unique radio, gramophone and movie museums, dealing with such matters as to obtaining a spark coil for a, 1912 Telefunken spark transmitter, a diaphragm for a 1928 Western Electric 17A exponential theatre horn, the correct adjustment for the shutter of an 1896 Edison projector "Kinetoscope", and so on.

VK7NOW did not come on the air until December 1977.

Regarding my "rash" statements re the length of the 300 ohm flat ribbon feeder stub for the G5RV, I merely quoted what was told to me during a QSO with a ZL, and I repeat his words, "I have had many contacts with G5RV on 40 metres and he informed me that, somehow, the textbooks have got the wrong information — the correct length is 32 ft. 6 in."

I would therefore assume that G5RV knows what he is talking about — he designed the antenna.

I agree entirely with VK3SV that any specific type of antenna does not perform the same in all locations. There are many variables, such as nearby objects which absorb or reflect radiation, the Geomagnetic reading of the ground, and so on.

VK3SV states that he started off with a certain length feeder, then trimmed it back to 29 ft. 3 in. for zero SWR".

That is like starting out with a Daimler double six and because it uses too much petrol, to replace this with an X6 motor.

I have it on good authority that, provided all the measurements are correct, the way to reduce the SWR is to vary the length of the 75 ohm coax — not the 300 ohm stub.

However, at its best, the G5RV is only a compromise all-band antenna, which is ideal for portable work, because it is easily transported and erected.

No multiband wire antenna (except a Rhombic) is as good as a beam on 20, 15 and 10 metres, and no multiband antenna is as good on 80 metres as an inverted V which is cut for a specific frequency.

To summarise I would say this: Beware of the "law of commonsense" and realise that theoretical capabilities of antennas are seldom realised in practice. Think carefully before putting up any antenna — is it suitable for the job in hand? Finally, accept the fact that there is no wonder "antenna to end all antennas" — some types are more suited for certain jobs, but they all have their limitations, even the mighty Rhombic.

Finally, when VK3SV and myself have gone to "the big broadcasting station in the sky", mere mortals on earth shall still be arguing that such and such antenna is better than the other.

Yours sincerely,
Jim Davis VK7NOW ■

REPEATERS

At the recent Federal Convention in April it was agreed that there would be no change to the FM Section of the 70cm band.

The FM Section is reprinted below—

438	
.025	
.05	
.075	— Mobile Voice
.1	
.125	
.15	
.175	
.2	
.225	— Mobile Voice Prim.

25	
.275	
.3	
.325	
.35	
.375	— Mobile Voice
.4	
.425	
.45	
.475	
.5	

.525	— Mobile Voice Nat. Prim.
.55	
.575	
.6	
.625	
.65	
.675	
.7	
.725	
.75	
.775	
.8	

.825	— Voice Prim.
.85	
.875	
.9	
.925	
.95	
.975	

.975	
439.0	— Voice Nat. Prim.
.025	
.05	
.075	
.1	
.125	— Voice Prim.
.15	
.175	
.2	
.225	
.25	

.275	— Mobile Voice
.3	
.325	
.35	
.375	
.4	
.425	— Mobile Voice
.45	
.475	
.5	
.525	
.55	
.575	— Mobile Voice
.6	
.625	
.65	
.675	
.7	

.725	— Mobile Voice
.75	
.8	
.825	— Mobile Voice
.85	
.875	
.9	
.925	
.95	
.975	

.975	
440.0	
.625	
.65	
.675	
.7	
.725	— Mobile Voice
.75	
.775	
.8	

Inputs are 5 MHz	below outputs.
------------------	----------------

All primary repeater channels to be allocated in each State first.

All channels not designated for Voice can be allocated by a State or the Federal Repeater Committee as required (linking repeaters or for use on other modes).

Therefore at this stage the UHF mobile service has ten repeater and three simplex channels.

The following Band Plan for FM on 2 metres is printed for comment before being put to each Division for voting. All comments to be sent to the Federal Repeater Committee care of the Federal Office in Toorak.

RECOMMENDED MODIFICATIONS TO THE WIA BAND PLAN FOR THE 144 MHz BAND

1. INTRODUCTION

There appears presently to be a need to make provision for additional simplex and repeater channels in the segment 146-148 MHz, and to provide additional channel space for various special purpose communications.

The Committee has also considered the need to keep primary voice communication channels and special purpose channels clearly distinct from one another, preferably by allocating these two types of channels in distinct segments of the band.

It would also appear that, in order to provide an adequate number of simplex and repeater channels for the future, it is desirable to implement a 25 kHz channelling system.

2. RECOMMENDATIONS (See Chart below)

2.1 That primary voice communication channels (simplex and repeater) be located in the segment 146-147 MHz.

2.2 That special purpose nets (special liaison nets, data nets, etc.) and special purpose or local coverage repeaters be located in the segment 147-148 MHz.

2.3 That 25 kHz channelling be implemented as follows:—

(a) **Simplex:** Immediate availability of all possible 25 kHz simplex channels in the segments 146-147 and 147-148 MHz.

(b) **Repeater:** In the segment 146-147 MHz, only repeater channel pairs on 50 kHz channel spacings to be used at present; 25 kHz splits reserved for future use.

In the segment 147-148 MHz, 50 kHz and 25 kHz split channels both to be immediately available, with no priority of usage.

2.4 That repeater channels be allocated by State Repeater Committees, bearing in mind, however, that certain special purpose repeater channels may be allocated on a national basis.

3. DISCUSSION

3.1 It is felt that this proposed system conforms well with existing usage and requirements within all States.

3.2 By concentrating the major voice communication channels (simplex and repeater) within the segment 146-147 MHz, this plan provides for greater convenience of channel switching than would be the case were these channels spread across the full 2 MHz.

3.3 Interference problems between major voice communication channels and special purpose channels are minimised by allocating them in separate segments of the band. This is especially valid in the case of microprocessor and data nets; with the implementation of 25 kHz channelling, high speed data transmissions would cause interference problems to adjacent speech communication channels.

3.4 This plan does not in any way reduce or limit the number of channels available, nor the freedom of State repeater committees to allocate them as they see fit.

146-147 MHz

PRIMARY VOICE COMMUNICATION CHANNELS

50 kHz	
splits	
existing	25 kHz
channels	splits

Repeater Inputs	146.000	.025
	.050	.075
	.100	.125
	.150	.175
	.200	.225*
	.250	.275
	.300	

Simplex	.325
	.350
	.375
	.400
	.425
	.450
146.5 = national calling ch.	.500
146.45† primary	.525
146.50 = RTTY*** (national) others = secondary	.550 .575**
Repeater outputs	.625
	.650
	.675
	.700
	.725
	.750
	.775
	.800
	.825
	.850
	.875
	.900
	.925
	.950
	.975
	147.000

25 kHz splits
 * Repeater channels reserved for possible further use.
 ** All simplex available immediately.
 *** RTTY channel is an exception to the recommended rule of allocating special purpose nets above 147 MHz, as it is an established and well populated channel.

The simplest method of designating 25 kHz simplex splits is to give them a letter, e.g.: 146.475 = 4BA, 146.525 = 50A.

147-148 MHz

LOCAL OR SPECIAL PURPOSE OPERATION (voice or data)

No distinction in priority between 50 kHz and 25 kHz channels.

Channel	Suggested use
---------	---------------

Repeater outputs	147.025
	.050
	.075
	.100
	.125
	.150
	.175
	.200
	.225
	.250
	.275
	.300
	.325
	.350
	.375
ATV liaison (nat.)	

Simplex (special purpose)	.400
	.425
	.450
	.475
	.500†
	.525
	.550
	.575
	.600
ATV liaison	
ATV liaison	
ATV/SSTV/FAX	
SSTV/FAX liaison	
not yet allocated	
not yet allocated	
micro net†	
data net	
data net	

Repeater Inputs	.625
	.650
	.675
	.700
	.725
	.750
	.775
	.800
	.825
	.850
	.875
	.900
	.925
	.950
	.975
ATV liaison (nat.)	

* Already in use for this purpose in VK2 and VK3. Recommended nationally.

† Is used in bigger States as national secondary voice channel. It was felt that 7 simplex channels that were specifically allocated were sufficient for all States (to keep within the principles outlined in para. 3.1 and 3.2).

MT. GININI REPEATER STOLEN

On Saturday morning (1st April 1978) the Channel 7 repeater on Mt. Ginini was stolen.

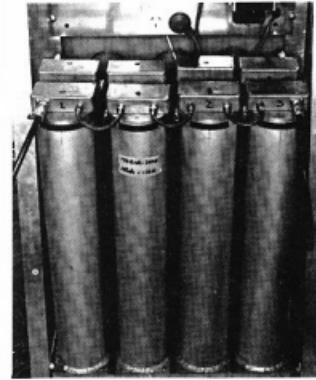
The DCA compound was entered using bolt cutters and the University building was broken into through the side by removing the metal cladding and insulating material. The power cable was cut, turning off the University's seismic recording equipment. This accurately established the time of theft at 0711.

The only equipment stolen from the hut was the repeater, which comprised the power supply, duplexer, receiver, and transmitter. This was done in such a way as to suggest that the equipment is going to be put back into service.

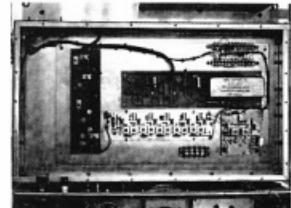
The matter is being investigated by the ACT Police and the District Radio Inspector with the enquiries.

The Committee of the ACT Division has resolved to re-establish a new repeater as soon as possible. To this end a fund has been established with an initial target of \$1,000.

Unfortunately a new facility will not be available until after winter. This therefore makes the return of the original equipment vital. If anybody has any information on this matter it should be forwarded to the Secretary, ACT Division, P.O. Box 46, Canberra City.



The repeater is unique in its design using eight home constructed aluminium cavities. The design is based on the ARRL repeater handbook.



Transmitter with aluminium cover removed.

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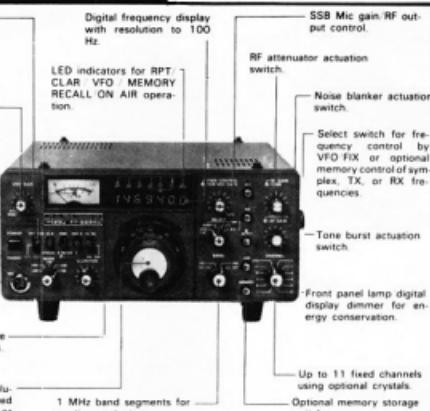
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VK2	VK2WI, Sydney	52.450
VK2	VK2WI, Sydney	144.010
VK2	VK2RMR, Mittagong	144.120
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.440
VK3	VK3RTT, Mt. Mowbullan	144.490
VK4	VK4RBB, Brisbane	143.490
VK5	VK5VF, Mount Lofty	53.00
VK5	VK5VF Mount Lofty	144.800
VK6	VK6RTV, Perth	52.300
VK6	VK6RTU, Kalgoorlie	52.350
VK6	VK6RTW, Albany	52.650
VK6	VK6RTW, Albany	144.500
VK6	VK6RTV, Perth	145.000
VK7	VK7RTN, Launceston	52.480
VK7	VK7RTX, Ulverstone	144.900
VK7	VK7RTW, Ulverstone	143.475
VK8	VK8VF, Darwin	52.200
JA	JA1GJY, Nagoya	52.500
KG6	KG6GDX, Guam	50.110
KH6	KH6EJO, Hawaii	50.110
TI	TI2NA, Costa Rica	+ 50.000
W	WA5ZRA, Los Angeles, USA	+ 50.000
ZL1	ZL1VHW, Wellington	145.100
ZL1	ZL1VHW, Wellington	145.150
ZL2	ZL2MHHF, Upper Hutt	26.170
ZL2	ZL2VHP, Palmerston North	52.500
ZL2	ZL2VHP, Wellington	145.200
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

* Denotes a new listing.

Information comes to hand from Graham VK8GB that during a contact with Erik TI2NA in San Jose, Costa Rica, he learned KJ6HJI runs a beacon 24 hours a day on 50.080; sending "TI2NA TEST" in CW. In May or June he hopes to run another beacon on 52.080. He listens on 50.150 and 52.150 when the beacons are on. He uses a Swan 250 and a 4 element yagi.

Graham also further mentions HL9WI in South Korea on 94-78 at 0043Z heard the WA5ZRA beacon in Los Angeles, which runs 100 watts. As a result of these two reports the above two beacons have been included in the list.

Continuing on from the excellent conditions reported last month from Darwin, Graham VK8GB sends a further letter to keep his diary going!

23-378: 6 metres, 0930 to 1255Z, JH1, JA2 and JA6.

23-378: 6 metres, 1017 to 1402Z, JA1, 2, 6 and 7, KJ6HJI and KG6DX, 10 contacts. On 2 metres: JH6TEW, JR8NCT, JA6S2C and JR6NSV, 1130 to 1242Z.

30-378: 6 metres, KG6JH, KG6JDX, JA2, 4 and 8 for 7 contacts.

31-378: 6 metres, 1042 to 1319Z, 22 contacts in districts JA1, 2, 3, 4, 5, 6 and 7.

1-478: 6 metres, 0321Z, KH6JIA; 1135Z, JAKT, JAH1HHL.

2-478: 6 metres, 0300Z, KH6JSI; 0620Z, KH6JII; 1040 to 1347Z, 16 contacts. On 2 metres: 1146 to 1155Z, JH6HJI, JA6ABG, JH6TEW and JASUKI.

3-478: 6 metres, 1205Z, 5 contacts JA1 area.

5-478: 6 metres, Brian VK4VW worked JH6TEW, HL9WI, JA4 and 5 between 1133-1200Z.

6-478: 6 metres, 1020 to 1205Z, KG6JH, KG6JDX, plus JA1, JA2 areas, for 7 contacts. On 2 metres: 1122 to 1223Z, 14 contacts in JA4 and 6 areas.

7-478: 6 metres, KH6JIA 0325Z, 0333Z to JH6HJI and 0352Z KH6JSI. Also worked 12 stations JA1, 2, 5, 6, 9 and 0 areas. On 2 metres worked 38 stations between 1110 and 1304Z in JA4 and 6 areas.

8-478: 6 metres, 0215Z KH6JHI, 0630Z KH6JSI. Three JA1 and KJ6HJI. On 2 metres: 1120 to 1230Z worked 10 stations JA5 area.

9-478: 6 metres, 1040 to 1232Z, JH6HJD, HL9WI and KG6JDX. On 2 metres: 1117 to 1220Z worked 10 stations JA4, 5 and 6 areas.

Graham includes the following notes for your information from his diary - 27-378: 3D2CM worked to JA, 28-3: FK6AB on 52.035 between 0426 and 0440Z worked JH1HJK, JA1RJU and JA1LZK. KH6JHI worked KH6JHI and 17 VIK's and around 0380Z KG6DX worked VK2DXT and VK2BBO. 29-3: P29HV, ZDU, ZOK, ZJP and ZWW all worked KH6JIA 0903 to 0941Z. Other P29's active are ZPS and AS. 30-3: YJ8KHM to JA, 0820 to 1031Z. 31-3: Good JA opening to VK5/VK3, also regularly VK6WD worked 32 JA stations. 1-4: KH6 regularly working 3D2CM. JA to YJ8KM and ZL4VL. KG6DX to VK5KK, JA hearing VK3DT, also worked the head KJ6HJI. 2L to JA, 0800 to 1000Z. HL9TG is located at Pyeong Hyeon, 60 km south of Seoul, runs an SB10 to a "Swirlo" antenna. KH6 hearing ZL TV again. 5-4: Bill HL9WI confirmed the FM signal on 49.3005, heard regularly in Darwin, is HLKA located in Korea. JA to VK3, 6-4: JA to VK2, VK4, WB6LBJ/DU2B had six on JA, in JA, KH6HJ, KG6DX 0230Z. VSSAM reported active on six. VK3AUR worked KH6HJ, KH6JHI hears VK4RTL, 7-4: VK8VW worked KH6NS, who used a Swan 250 to an 80 metre dipole! (The wet string will be out next... 5L.P.) 8-4: KH6JII works VK4, VK8, YJ8ZM 0630Z, 9-4: 0043Z, HL9WI hears WA5JRA beacon on 50.091. HL9WI works into Perth.

Graham advises the KH6EJO beacon is being heard daily, sometimes with signals with S9 + 20 dB. It runs 700 watts to a yagi and needs to be strong if you expect to work anyone. "We often hear it when the yagi is pointed at the U.S. At 0402Z it points at Guam and 0700Z at the South Pacific. On two metres we have had 12 openings to JA during the month of March and a total of 20 openings to 9-4 inclusive. I have had 269 contacts with JA1, 5 and 6 during this period on 2 metres. Brian VK8VW says that on FM the flutter on JA signals is gone and they are armchair copy. Finally, Ken VK6ZQF is running skeds to JA nightly on 144.200."

It makes one positively drool at the mouth to read of all the variety of contacts available in Darwin, and this appears only to be the start, the sunspot count is rising, and the next two years might well produce some very spectacular contacts. Thanks once again, Graham, for your letters.

Tony VK8VW in Kalgoorlie sends two letters with information of DX activity in his area, opening with a contact to VK8VW on 7-11-77, 13-11 produced 31 contacts in VK1, 2, 3 and 5. Almost daily openings through the rest of November to the Eastern States. Then on 3-12 worked 42 stations in VK1, 2, 3 and 5 and 23 further openings through 28-29-30 with 12 stations worked for the rest until Tony heard JAs on 50 MHz. Called CQ on 52 MHz and worked JH4SSP, who had worked 50 VHF stations that day, 14 JAs were worked on 7-4 in JA1, 2, 7, 8 and 0. The contact to JA8US was over a distance of 5,134 miles, the whole opening occurred between 0433 and 0524Z, signals varying between S3 and S9+. On 12-4 worked JA1, 2, 3, 4, 5 and 6, 15 contacts 0440 to 0540Z, to S9, 13-4: JA1, 0, 26 stations, 0325 to 0900Z. A further opening same day, 1345 to 1430Z, working JA1, 3, 5 and 8, to S9 with flutter. One JA station informed Tony that on 13-4 the Japanese stations had worked all VK States, P29, KH6, VWS and some other areas, but no ZLs. QSL info for HL9WI: Manager WA5ZWC or to Bill Boykin, HQ, 8th Army Engineers, APO, San Francisco 96301. Any HL cards can be sent to this address and he will forward on via the Bureau. So far Tony has not made it to JA on 2 metres.

George P29HV writes to fill us in on the happenings in Papua New Guinea. On 6 metres the season has been much better than 1977, when the best was the spring equinox giving JA1 to 6 only. The unexpected opening on 3-12-78 gave JA1 to 4 and JA6. The autumn equinox so far has produced contacts to all JA1 call areas including the distant JA1 and JA6. Oh, and also worked KG6DX, KJ6HJ and HL9WI several times. The season first started on 2-3-78 and has been open on six metres nearly every night since, firstly around 1200Z but now earlier around 0900Z and last longer, often fading out as late as 1400Z, although Malaysian

TV can often be seen as late as 1530Z. The earliest the KH6EQI beacon has been heard is 0720Z, but normally comes in about 1800Z.

George regularly monitors TV stations and so far has copied stations from China, Indonesia, Malaysia, Philippines, Korea, Hawaii and Japan, the last named being Japanese channels 1, 2 and 3, which are equivalent to the Australian channels 3, 4 and 5, and had been able to monitor the sound from these channels on his National GX400M portable on the FM band using the built in whip. No 2 metre signals heard.

KG6 from Guam often fade in just before the JA's fade out, with strong signals at times. No afternoon TEP, all goes over their heads in Port Moresby, KH6EQI first received 12-3. On 29-3 worked KH6IA and on 8-4 three stations, and copied Hawaiian TV channel 2 and 3 (Aust 1, 2, 2). No Es worked from VK since 2-2-78. Last November TV from Darwin on ch. 6 and 8 copied, indicating further contacts with Darwin possible on 2 metres. Through December much high band TV from Townsville, Cairns and Mackay, but nothing during January and February. Signals returned in March, on 20-3 P29ZEV Col drove to the top of Paga Hill, 250 feet a.s.l. beside the city of Port Moresby, and worked key up the Townsville repeater VK4RAT-2, strength 3, 0525 to 0757Z, when signals faded, no one at other end to make a QSO!

Activity is increasing on P29 on six metres, and from Port Moresby are Ken P29ZUD, Jane P29ZOK his XYL, Hugh P29BH, Lee P29LS, Wayne P29ZW, George P29JW and John P29ZJP using a portable 3 watt SSB rig, and has worked JA several times. In the Gulf Province there is Graham P29DJ, from the Highlands; Peter P29ZPS at Yonki; Madang Province P29ZNL; Sepik Provinces Jim P29AS. Consideration is being given to the establishment of a 6 metre beacon for P29, and George asks if I think it would be a good idea. Sure do, hope it can be operational for the 1978 summer Es period. Thanks, George.

From Harry VK2BXT comes a note advising opening to JA1, JA2, JA3, JA4, JA5, JA6, JA7-78, 0310 to 0328, 27-3, JA1 and JA2, 0440 to 0512Z, and 29-3, 0321 to 0342, KG6JHJ and KG6GIO. Firstly, the JA1, 2 and 3, JA6/JH1 were very good, and they were also working Ross VK4RHO and Red VK4ZRD. Harry's contacts were between 52.030 and 62.070.

Steve VK3OT sends along quite a lot of information, some of which has already been covered and confirms what has been written. Steve's primary VRDX is still looking for a six metre rig to operate from the Solomon Islands, as long as he can cult it when he leaves. Why? Is six metres that bad! VSSAM in Brunel on 6 metres looking south!

Signals on 6 metres have been reaching the VK3OT area many points north, during March and April. 28-3: VK3OT worked JH-BFR, JA1TT178 and JH-BKJ 0600Z at 5, 3, 2. Heard by DUX001 JA1XPD from northern Manila at 0618Z, 30-3: JH1WHS on CW 555, 313-3: KH6EJO beacon heard at VK3AUR at 0630, 519, 1-4-78: VK3AUR hearing KH6EJO again at 0508, 0519. From 0510 to 0606 VK3OT, VK3AMK, VK3AKK, VK3VZ and VK3AWY worked JA1, JA2, JA3 and JA4 after monitoring 50,110. Melbourne also had JA3, JA7, JA9 and JA0 up to 9+ at times. 2-4-78: 0333, JA0A/GA 5 x 9+, band until 0416Z with JA1, 2, 9 and 0.

JAY2BZ reported to VK3OT he has worked 19 countries on 6 metres; March 1978 brought him 3D2CM, FK6AB, KH6s and YJ8, 3-3-78: CE3OK worked JASCMO at 0005Z on 50.095, 26-3: FO2RQ heard in Japan about 0402Z, 30-3 and 31-3: YJ8BKM worked over 200 JAs in all areas! Clay KL7FB1 in Alaska has not heard anything on 6 metres so far, only a few pings. Now has 600 watts going on 2 metres but as yet only for QSOs through Oscar.

11-4: 0438 to 0505Z, VK3AMK worked JA1, 3, 5, 8 and 0, 12-4: VK3OT worked KG6DX, 559 at 0402Z. Had CW 0505 with JA1, JA1, JA2, JA3 around 0402Z. Between 0433 and 0504Z Steve had 60 contacts with JA1, 2, 3, 4, 7, 9 and 0, with SSB to 9+ +. Total QSL count for 1-4 to 12 showed JA1 and JA6. Oh, and also worked KG6DX and HL9WI several times. The season first started on 2-3-78 and has been open on six metres nearly every night since, firstly around 1200Z but now earlier around 0900Z and last longer, often fading out as late as 1400Z, although Malaysian

Steve asks for notes from those interested in all VK, ZL and Pacific openings for inclusion in

SMIRK/73 VHF column. He also reminds you of the 6 metre liaison frequency of 28.575 to 28.585, 0300 to 0700Z daily.

Either the VK4s, particularly in the north, are too busy working all the exotic DX or have closed down as I haven't heard a squeak from anyone up there for many moons. What about something, chaps? Gordon VK4ZBI has written from the Rubyvale area, Central Highlands, to advise on some of the 2 metre activity there. Around Easter some favourable troughs in the atmosphere produced some good signals around 144.1. On 26-3 Ivan VK4OO was to transmit from Billabong to Harry VK4LE at 2030Z using channel 50 and a 10 element quad. Nothing happened but Gordon did work Frank VK4FU 5 x 5. This is an E/W contact along the Tropic of Capricorn 1,000 miles, 10 wpm each. On 27-3 Gordon kept his evening morning sked at 2000Z with Harry VK4LE, 85 miles away, and contacted Claude VK4UX, 330 miles away. Signals were weak at first but later peaking to 5 x 9; also worked Lee VK4RH on FM over a distance of 420 miles. Gordon suggests the Brisbane gang should get up in the mornings around 0630 local time and scan the bands, much better conditions exist than in the evenings!

Thanks for writing, Gordon. Pleaseing to note there are still areas around keeping the two metres alive, other than VK4, and shows there are areas elsewhere than between Albany and Adelaide and Melbourne where conditions do improve enough to allow a few contacts. Keep up the good work, boys!

We are all saddened to hear of the equipment being stolen, and Andrew VK4AUI has written stating the equipment was stolen from his shack on 1-4-88, about 0700 hours, with the gear being skillfully removed because it was done by persons who knew (1) what they wanted, (2) where it was, and (3) how to disconnect without breaking anything. The University owned equipment in the hut was not touched.

The ACT Division is going ahead with the re-establishment of the beacon and has set up a fund with a target of \$1,000 needed to get the system going again. The project will again be headed by Peter VK4RHM, who designed all the RF stages for the previous gear. Some PCBs are available, but no information on the metal-work. The duplexer has to be rebuilt from scratch as the one at Ginini consisting of air cavities was neatly removed! The Division is appealing for any help which can be forthcoming from other areas as they have to erect their own building this time, too. Due to weather conditions at Ginini it is unlikely any new equipment can be installed before spring. So can any other repeater groups or individual people assist in any way, financially or otherwise?

The above theft, coming right on top of the destructive vandalism of the EME equipment at Dapto, paints a rather sorry picture for the continuing state of amateur radio. On the matter of the EME equipment, Lyle VK2GALU reports the University staff have evaluated alternative sites for the 432 MHz dish and have selected one, and are now obtaining estimates of the cost before making a decision whether to proceed.

On the brighter side, Andrew advises VK1VP and VK1RK have both worked JAs on 6 metres in late March; also Phil VK2BVM, just across the tracks at Cusenbeyan, worked his JA too, using the familiar handbag radio, the IC502 barefoot to a 3 element beam! Incidentally, Andrew suggests other areas contemplating the erection of repeaters might well copy their proven design instead of going through the many problems of individual designs. Good idea.

Roger VK2TBT forwards a paragraph from "Wireless World" which should be of interest to readers. It is headed "Now TE mode on 432 MHz", and reads: "The record breaking long distance 3,180 miles contacts made on 144 MHz via ionospheric reflection between amateur stations in Venezuela and Argentina reported in the March issue have proved to be more than just one-time freaks. During February, world records on 144 MHz were again broken, and more than once. First the record was extended to 3,825 miles as a result of an SSB phone contact between KP4EOR in Puerto Rico (about 18 degrees north) and LU8DIZ in Argentina, and then again to 3,940 miles when

KP4EOR worked a 10 watt station LU8DIN, also in Argentina, but over a 100 miles further away. CX9BE in Chile also heard KP4EOR, but perhaps the most sensational news is that the VS2A in Venezuela is reported to have heard the Argentine in LU8A on 432 MHz! All these contacts and reception reports appear to have been due to TEP mode propagation. Whereas, until recently, this form of ionospheric reception was thought not to extend much above 70 to 100 MHz, it has thus been shown how to extend to 144 MHz and even above 400 MHz, although of course this still has to be confirmed by two-way contacts.

"This sudden extension to the upper frequency limits of TEP appears to be another reflection of the very rapid rise in sunspot numbers which has re-opened almost daily the 28 MHz band during recent weeks, and also brought to British listeners the sounds of American citizens' band operation on 27 MHz."

Roger adds: "That evening type TEP (Class 2) could support such high frequencies is an important event. It supports the notion that Class 2 TEP is partly a scatter mode and partly a guided mode of propagation, using small-scale field-aligned irregularities in the ionosphere of the equatorial region. It seems that the upper frequency limit of evening type TEP has been rapidly extended beyond 400 MHz; again amateurs have been at the forefront."

"With regard to the JA-VK and KP4-LU contacts on 144 MHz, almost certainly these have been via Class 2 evening type TEP, considering the timing, signal characteristics reported and the circuit involved. I am endeavouring to get some ionospheric information from the US and the USSR with a view to showing what mode of propagation supported the contacts. I refer readers to my 1972 article in AR where I mentioned the possibility of evening type TEP supporting propagation on 144 MHz. It also seems that the section of the ionosphere that supports this propagation affects satellite doppler shift as reported in 1974 in the AMSAT Newsletter (The Inverse Doppler Anomaly). If the equatorial ionosphere generates small-scale irregularities of such density that they will support 432 MHz propagation, then undoubtedly these same irregularities will affect 400 MHz satellite signals." Thanks, Roger.

Gill VK3AUI sends some pages of the "Radio ZS" magazine which is published in South Africa, and there are a few interesting bits for you. The UHF bands from 1215 MHz and higher are the same as for VK area. However, on the VHF scene they have 50 to 54 MHz, 144 to 146 MHz and 430 to 440 MHz. On 432 MHz there has been recent confirmation of what appears to be the South African record distance for that band of 900 km between ZS1HS and ZS3B on 5-11-77.

In the section devoted to the world above 50 MHz, the sub-editor ZS6IY writes: "It is rather a barren world from the ZS point of view excepting for FM activity at the major centres on 2 metres via repeaters; 70cm has a few adherants and activity is minimal. Despite the many hundreds of multi-mode 2 metre transceivers and many transverters about, there is very little sustained SSB activity and very much less on 70cm. Oscar activity is relatively lively due to the excellent support rendered by Greg Roberts ZS1BI on a 'one man band' basis. ZE1JJ is unable to secure his WAC using the EME mode since there is no other station operating in Africa to make this possible. . . . It is considered that a fair statement of the present position and a positive proposal is 'that the bands 50 MHz and above will continue to accommodate the amateur as well as the existing active system of VHF working groups is introduced to promote activity throughout South Africa on an area or branch basis as convenient, and under council authority through a VHF manager, and furthermore that the arrangements finally decided upon be maintained as a permanent feature of SARL policy and activity'. To be submitted to SARL AGM 1978."

Well, there you have it, things are not so bright in that part of the world, but maybe they have been sharing some of the TEP DX which has been evident in so many other areas recently. May be the former paragraph tends to explain why there seems to have been no recent 50 MHz contacts across the Indian Ocean to VK land for so long, and why there has never been a 144 MHz contact.

It has been stated before that the long path between the two continents is a difficult one to support the conditions necessary for such contacts, but they do not seem impossible today, but we'll see if there is no 144 MHz activity at the Argentine end.

A letter has come to hand from Bruce VK2AMT, which covers a point of interest not generally thought about. Here is a portion of Bruce's letter: "I have read your column in AR for many years with great interest. However, it is not obvious to any newcomer to this part of the spectrum what modes are used in the UHF region for DX work . . ."

O.K. The following brief statements would probably cover the requirements of the question. 432 MHz in the main is covered by CW and SSB, mostly the latter. The region 432.000 to 432.100 is largely requested to be kept clear by high power stations due to interference with EME stations. Above that any present activity would not go much above 432.200, if you leave out ATV. There is some FM activity around 435 MHz, in many cases using commercially built multi-channel equipment.

Around 432.1 MHz the CW may be transmitted from straight transmitters from a lower frequency crystal and separate receiver/converter combination, but I guess most activity centres around transverters which use an HF transceiver as the SSB source mostly at 28 to 30 MHz, but some at 14 MHz, and with an oscillator chain producing the required 404 MHz for injection. There are quite a few operators using modular or stripline constructed transverters of commercial production giving 100 watts output at 432 MHz. These are often used barefoot, although the tendency now is for some stations to use 100 watt linear amplifiers to raise the signal levels. Antennae range from 7 element yagis through to 16 element high gain devices, or stacked arrays.

Much the same situation exists at 1295 MHz except for the lack of high output linear amplifiers. Here CW operation can be undertaken by using 144 MHz as the originating source, but this is generally not suitable for SSB, which generally would use 144 MHz as the originating SSB source to a suitable oscillator chain. There are many such combinations. Antennae are mainly three to five dipole fishes, although I remember years ago Rod VK2BQL, when he operated from VK5, used a stacked array of yagis with good effect.

Also for 1295 MHz operation some operators use varactor diodes to triple from 432 MHz, but this would then be limited to CW or FM. So there are many combinations, all of which have their advantages and disadvantages, so it seems the newcomer might well speak with those already in the game to get some basic ideas if in doubt.

It seems Western Victoria is to suffer on the 144 MHz band with the proposed introduction of a Channel 5A TV station there, probably about 1980. Steve VK3OT has written to his local member of Parliament, who happens to be the Prime Minister, and received confirmation that a 5A was going to be erected there. (See Letters to the Editor, this issue.) Such a station is going to affect quite a large area of 144 MHz operators throughout Victoria and even South-Eastern VK5; there are always those listeners well out of the service area of TV stations who try their utmost to receive them, and then complain of interference. So now there will be three Channel 5 stations to interfere with six metres, as they have always done, and a total of four SA stations to be heard in the 144 MHz band. Things look really bright for the future, don't they?

Before closing, you might be thinking there has been no activity in VK5 of late. No worries, we have been working our share of JAs, KG6, etc. We haven't had the openings like the northern boys, but we have equalled or had better than VK3, so we are not grumbling, it's just that it would simply be repetition to go over it all again!

So we close with the thought for the month: "If we exaggerated our joys as we exaggerate our woes, our troubles would lose all their importance."

The Voice in the Hills.

SUPPORT OUR ADVERTISERS

VK-ZL OCEANIA Dx CONTEST RESULTS 1977

OVERSEAS AMATEUR STATIONS

PHONE

LISTENERS' SECTION

PHONE

DL-A361/158337	550	JAS-1697/1
DL-A33/131090	414	JAS-3891
HA-007	36	JAS-3888
JAT-3331	11410	JAS-9092
JAS-8331	8904	JAS-8670
JA1-16780	7626	JAS-8783
JA1-16277	6789	OK2-22130
JASLFB	6260	OK3-26555
T-SASAKI	3816	JAS-18684
JAS-9304	3696	ONI-303

DM5323/M	1564	DM1428/M	780
DM7215/I	1500	DM3501/G	540
DM8522/H	1500	DM6754/A	234
DM8706/I/G	1488	DM5850/N	130
DM6721/G/A	1078	DM6850/A	90

CW

DM-6754/A	2014	JAO-2811	920
DM8709/D	900	JAB-3591	60
DM0721/G/A	110	JAS-8783	56
JA1-4570	5440	JAS-12313	40
JAT-8624/7	4264	OK2-19749	306
JA4-4665	1440	OK1-11861	816

AROUND THE TRADE

FRG-7 OWNER'S GUIDE

Dick Smith has introduced a guide to the Yaesu FRG-7 Short Wave Receiver which, according to Dick, "continues from where the instruction booklet with the set leaves off".

The six-page guide was written specially for Dick Smith by noted short wave correspondent Arthur Cusden, M.B.E.

It describes the step-by-step procedure for tuning stations on known frequencies, provides information on international short wave and amateur bands to listen to, explains the 24 hour clock and G.M.T., lists transmission times and frequencies for broadcasts for the major short wave transmitting countries of the world and concludes with a run-down on short wave listening as a hobby.

Dick Smith is offering this useful guide FREE with each Yaesu FRG-7 receiver sold through his eight electronics stores or by his mail order department.

UHF PRE-SELECTOR FILTERS

Spectrum International's Low Loss factory tuned, Pre-Selector Filters are a 3 pole inter-digital design. They have the traditional bar transmission line structure and are constructed from brass stock.

The electrical design approximates to a 0.1 dB ripple, Tchebychev characteristic.

TECHNICAL DATA

PS1432 — \$38.70, freight extra. Freq. Range (MHz) 420-450; Ripple, typ. 0.1 dB; I.L., typ. 0.15 dB; Impedance, nom. 50 ohms; VSWR, peak, typ. 1.25; Shape Factor, 30 dB 4:1; Power, max. 100W. Mech. Data: Length (plus coax's) 7½ ins.; Width 4½ ins.; Thickness 1 inch; Connectors, std. BNC.

PS11691 — US\$49.95, freight extra. Freq. range 1650/1750; Ripple, typ. 0.1 dB; I.L., typ. 0.2 dB; Impedance, nom. 50 ohms; VSWR, peak, typ. 1.25; Shape Factor, 30 dB 4:1; Power, max. 100W. Mech. data: Length (plus coax's) 2½ ins.; Width 4½ ins.; Thickness 1 in.; Connectors, std. TNC.

PRE-SELECTOR FILTER APPLICATION NOTES

Low pass pre-selector filters exhibit high attenuation to out of band interfering signals and negligible loss to in-band signals. They also attenuate the "image noise" band in heterodyne receiving systems thereby providing up to 3 dB improvement of receive system noise performance.

Receiver front end selectivity is difficult to realize in the typical small UHF converter. The addition of an external pre-selected filter can result in much improved performance for the sensitivity and out-band intermodulation (IMD) characteristics.

In urban areas having high concentrations of FM, TV and mobile radio transmitters, most receivers have excessive "birdie" responses due to out-of-band signals. The addition of a pre-selector filter before the receiver tends to eliminate the unwanted responses. In fact many receivers seem dead after fitting a pre-selector filter due to the resulting very low background noise, but jump to life whenever an in-band station is tuned in.

Another excellent application is following an up-converter, to clean up the transmitted spectrum before high power amplification.

Let's keep our transmissions clean.

— Submitted by Spectrum International.

Spectrum International of Concord, Massachusetts, USA, have advised that their XH102 filter is no longer available and all stocks are exhausted. The XM-107-SO4 will continue to be available as before. XM-107-SO4 will continue to be available as before.

QSP

Mt. GININI REPEATER

From the President of the VK1 Division comes news that the fund for the replacement of the Mt. Ginini repeater will be closed on 30th June, 1978, although any later donations would naturally be accepted with grateful thanks. A list of donors will be prepared for publishing in AR at a later date.

IARU NEWS

The following items have been extracted from the IARU Calendar No. 95.—

"In the last end-of-year Calendar we characterized 1978 as a year of growth. The year 1977 carried forth that growth, as the Union welcomed into membership eight new societies, representing amateur radio in Bahrain, Botswana, Indonesia, Jordan, Oman, Papua New Guinea, Sierra Leone, and Turkey. The membership of the Union now stands at 98, and applications have been received from Grenada and Senegal (ballots and full details enclosed in this Calendar).

Preparations for the 1979 World Administrative Radio Conference continued throughout the year to be the prime task of the IARU. The International Working Group met again, this time in England, and produced a four-page leaflet entitled "The Case for Amateur Radio", designed for use by IARU member-societies in their efforts to justify the Amateur Radio Service to their administrations. "Use it, or lose it!" became the motto stressed in the monthly WARC Newsletters mailed from Headquarters — a motto of amateurs as we continue to justify our present frequency allocations and our demands for more. To this end, amateurs in Australia shattered the 1296 MHz world distance record when VK6WG successfully established two-way communication with VK50R 1666 kilometers (1176 miles) away on 25 January. YV5Z and LUIDWG subsequently smashed the world's two-metre record when they spoke over a distance of

5000 kilometers (3107 miles) in October. Such breakthroughs by amateurs aid us considerably in justifying our claims that amateurs continue to contribute to the state of the art in electronics, and to offer significant findings in propagation theory.

The Organisasi Amatir Radio Indonesia was elected to membership of the IARU.

"The Deutscher Amateur Radio Club, the society of the Federal Republic of Germany, gave 600,000 visitors an impressive demonstration of amateur radio at the Berlin International Radio and Television Fair. Over 100 square yards of floor space were made available to the DARC volunteers, and DK0IA was put on the air around the clock. All Berlin amateurs were invited to an outdoor barbecue on 27 August (held between exhibition tents) so all fair-goers could see first-hand how many hams were in the area.

The DARC volunteers set up displays on Oscar satellites, state-of-the-art design of amateur equipment, and VHF repeaters. West Berlin's repeater, DL0SP, was linked to repeater DL0XK on the West German border, and daily reported the activities to DARC headquarters at Baunatal.

Audience participation is important in holding interest, so a visitor's bar was set up complete with headphones for attendees to eavesdrop on DK0IA. Also a map equipped with light bulbs flashed the location of each QSO, teaching a lesson in geography as well as in international friendship.

The Bonn chapter of DARC has taken over the Federal German Chancellor's office, displaying 200 QSL cards and 20 radio awards and diplomas on the reception area walls. The display is intended to represent typical amateur radio activities. So far at least 54 newspapers throughout the Federal Republic of Germany have published stories on the unique display."

On 12th February, 1978, KP4EOR established a successful two-way SSB contact with LUSDZJ, a distance of 5,319 km. A contact was also made with LUGAA.

Two further amateur societies are seeking IARU membership. These are the Grenada ARC and the Assoc. des Radio-Amateurs du Senegal.

The President of the IARU, Noel B. Eaton VE3CJ, advises that the work of his WARC Advisory Committee (loosely known as the IWG) seems now to have completed the preparatory phase of planning for WARC 79 and that it be transformed into the actual team to represent IARU at WARC 79. These conclusions were reached at the meeting of the Group 1 in Geneva last February, which was also attended by David Wiedman, the Federation President. What the team for WARC 79 cannot be completely finalised at this early date, the IARU President has chosen the following for the basic team: VE3CJ, W4KFC, W1RU, K1ZZ, WA6IDM, SP5FM, AA4AV and VK3KI.

There will be, he states, further nominations to this basic WARC team. He will be attending the meetings of all three IARU Regions to be held during the year.

Meanwhile, the IARU group referred to has produced an excellent leaflet entitled "The Case for Amateur Radio", designed to assist the amateur societies of developing countries in educating their national administrations on the need for the Amateur Radio Service in these nations. Copies will be in English, French and Spanish. This leaflet is quite one of the best on amateur radio ever produced and it is sincerely to be hoped it will be read and understood by administrations in the over-numerous less developed nations possessing an ITC vote.

The WIA recently received news that arrangements had been concluded between DARC (West German Am. Radio Society) and the Radio Society of Sri Lanka whereby a number of DARC members had volunteered to participate in a training course to be held in Colombo during October for amateur radio trainees. The DARC volunteers would fly to Colombo, and the expenses of the project would be met as to 50 per cent by IARU Region 1, with some contribution from IARU Region 3. The WIA



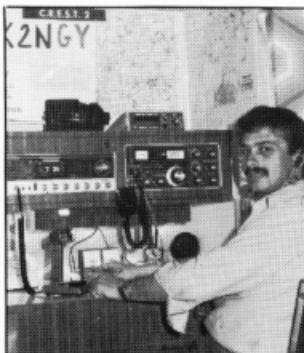
432 Linear Amp. — EDL432.

PS11296 — US\$38.70, freight extra. Freq. range (MHz) 1250-1340; Ripple, typ. 0.1 dB; I.L., typ. 0.2 dB; Impedance, nom. 50 ohms; VSWR, peak, typ. 1.25; Shape Factor, 30 dB 4:1; Power, max. 100W. Mech. Data: Length (plus coax's) 3 ins.; Width 4½ ins.; Thickness 1 inch; Connectors, std. TNC avail.■

AMATEUR RADIO ACTION

(published by Newspress Pty. Ltd. — publishers of CB Action)

IS THE NEW GENERATION AMATEUR MAGAZINE



Whether you're a CBer, wondering how hard it is to become a Novice, a Novice — wondering how hard it is to obtain your full ticket, or an old time ham — wondering what the hell is going on anyway — we think you will find plenty to interest you in this new magazine.

AMATEUR RADIO ACTION will go on sale at newsagents throughout Australia during the last week of May (NSW and Vic) and the first week of June (all other states).

The topics covered will include in-depth technical reports on the latest equipment by David Rosenfield (VK3ADM), reports on DX activity on all bands, what's happening in VHF, UHF, RTTY, SSTV, AND ATV, international reports on overseas amateur operations, "build it yourself" technical projects, propagation forecasts . . . and the many other things which go to make for interesting and informative reading.

We firmly believe that a magazine, be it on motorsport or amateur radio, should make interesting reading—we think you will agree that AMATEUR RADIO ACTION fills this requirement.

The magazine is dedicated to the advancement and promotion of amateur radio and, most importantly, assist-

ing the student and Novice while, at the same time, not being "written down" to the extent whereby the old time ham has little to gain from it.

The views of AMATEUR RADIO ACTION may not coincide with those of the "establishment" — but surely a fresh approach and controversial ideas can often cause major and/or minor reforms to the benefit of everyone. For instance, why should ITU standard morse be the standard for examinations when you're rarely likely to hear it on air anyway?

Why are copies of past Novice exam papers impossible to obtain although copies of the A.O.C.P. papers are readily available?

Are multiple question A.O.C.P. papers to be introduced — if so, when?

These are just a few of the questions which we'll be looking at in the first few issues of AMATEUR RADIO ACTION.

IF YOU'RE INTERESTED IN RADIO, THEN SOONER OR LATER YOU WILL BE INTERESTED IN AMATEUR RADIO — AND AMATEUR RADIO ACTION MAGAZINE IS THE ONE YOU'LL BE READING . . . !

First issue on sale last week of May (Victoria & New South Wales) — first week of June (all other states)

Available at all newsagents throughout Australia

Executive decided this was a most worthy project and donated \$250.

On 1-1-1979 the CCIR will have been in existence for 50 years.

TELECOMMUNICATION JOURNAL COMMEMORATES 20 YEARS OF SPACE FLIGHT

The October number of the Telecommunications Journal, the monthly review of the International Telecommunication Union (ITU), commemorates 20 years of artificial earth satellites by publishing two articles; one evoking the very beginnings of satellite techniques, the other dealing with an application of satellites which has, as yet, only been introduced on an experimental basis.

The first article, by L. S. Vedeshin and V. P. Dudykin, describes the preparation and launch on 4 October, 1957, of Sputnik I, the world's first artificial satellite.

In the second article, entitled "The Broadcasting-Satellite Conference", Ib Lonberg, the Chairman

of the conference which was held in January-February of this year in Geneva, discusses the Plan for direct broadcasting from satellites in the 12GHz band.

Earlier this year the Telecommunications Journal published a "Table of artificial satellites launched between 1957 and 1976" (price: 25 Swiss francs), which is a complete list of all satellites successfully launched from Sputnik I until the end of 1976.

* Telecommunication Journal, separate editions in English, French and Spanish. Subscriptions, by surface mail: one language, 75 Swiss francs a year; two languages, 150 Swiss francs a year; three languages, 225 Swiss francs a year. Price for a single copy: 7.50 Swiss francs. There are special rates for delivery by air-mail. Telecommunication Journal may be obtained from the Sales Division, International Telecommunication Union, Place des Nations, CH 1211 Geneva 20 (Switzerland).

AOCP EXAM AUGUST 1977

POSTAL AND TELECOMMUNICATIONS DEPARTMENT AMATEUR OPERATORS' CERTIFICATE OF PROFICIENCY

August, 1977.

SECTION M (Theory)

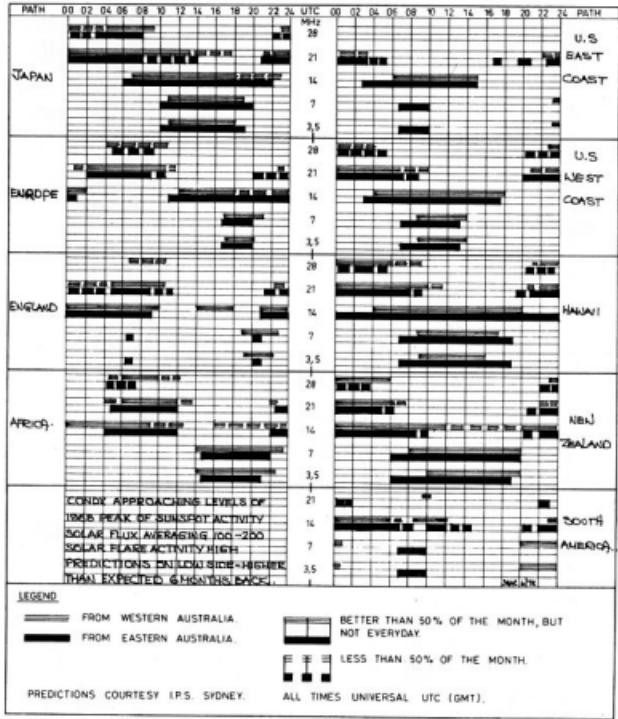
(Time allowed — 2½ hours.)

NOTE:—SEVEN questions only to be attempted. Credit will not be given for more than SEVEN answers. All questions carry equal marks.

1. (a) Draw the circuit diagram of an amateur station transmitter suitable for operation in the 144-148 MHz band. Explain briefly the theory of operation of each stage of the transmitter.
(b) Describe how you would tune the transmitter described in (a).
2. (a) With the assistance of a sketch indicate the ionospheric layers which exist during hours of —
(i) daylight, and (ii) darkness.
(b) Explain the meaning of the term maximum-useable-frequency (M.U.F.). Explain why this frequency is not constant over a long period.
3. (a) With the aid of a sketch showing the main component parts, explain the theory of operation of a cathode-ray tube.
(b) Show a method of connecting a cathode-ray oscilloscope to a telephony transmitter to indicate its depth of modulation.
(c) Sketch the pattern obtained when using the connections shown in (b) if the carrier is modulated at a depth of 100 per cent.
4. (a) What is meant by the following terms when used in reference to an iron-cored transformer:
(i) turns ratio; and (ii) impedance ratio.
(b) List the losses associated with the operation of a power-transformer and state how these may be minimised.
5. (a) Using diagrams, explain the principle of operation of crystal microphone.
(b) Draw a circuit diagram of a solid-state pre-amplifier, the input impedance of which will approximately match a crystal microphone.
6. (a) Draw a circuit diagram of a DC-DC converter and explain the theory of operation.
(b) List any advantages the converter in (a) has over the vibrating reed type converter.
7. Draw a circuit diagram of the radio-frequency amplifier and converter stages of a transistor type superheterodyne receiver. Explain how oscillation is produced in the converter and how the incoming signal is mixed with the oscillator frequency to produce the desired intermediate frequency.
8. Under what circumstances would you use:—
 - (i) an absorption wavemeter,
 - (ii) a heterodyne type frequency meter,
 - (iii) ladder wires,
 - (iv) a grid-dip oscillator,
 - (v) a cavity resonator?
9. A resistance of 3 ohms is connected in series with three resistances in parallel of 20, 50 and 70 ohms respectively. This combination is connected across a 30 volts power supply Calculate:—
 - (i) the total current flowing,
 - (ii) the power dissipated by the 50 ohms resistor,
 - (iii) the current through the 20 ohms resistor.

IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC



Due to circumstances beyond my control I have no summaries to offer with this month's chart. However, news is that solar activity has now reached a level equivalent to the peak of cycle 20 in 1968. Forward predictions are being revised to an estimated smoothed running number around 150 in approximately 18 months time. Then a broad peak extending over perhaps 18-24 months.

There are many indications that the higher frequency bands 28 and 50/52 MHz will really come to life as indeed reports do indicate quite extensive DX being worked on both 10 and 6 metres.

I am currently preparing a brief report on cycle 20 and awaiting further information regarding forecasts for cycle 21 to add to the report. I am enjoying some fine DX on 21 MHz to just about all parts of the world.

Of course winter will see some changes in some bands but the equinoctial periods in September 1978 and March 1979 will produce some really fine DX on all bands. If you are not prepared — now is the time to get ready to join the QRM on all bands. More next month.

Good DX. 73s VK3NAC.

NEW BOOKS FROM NEWNES—BUTTERWORTHS

for the RADIO ENTHUSIAST



NEWNES TAPE RECORDER SERVICING MANUAL 2nd Edition – Volume 1

& Gardner

NEWNES TAPE RECORDER SERVICING MANUAL volumes 1 and 2, provide the service engineer with information on a wide range of reel-to-reel and cassette machines produced between 1968 and 1974, following broadly the lines established in *Tape Recorder Servicing Manual* by H. W. Helvey covering machines produced before 1965. Volume 1 covers models produced in the period 1968 to 1970 while Volume 2 covers 1971 to 1974 models.

The information given is as concise as possible consistent with providing the engineer with the most important tests and adjustments and assumes that the engineer has a basic knowledge of test procedures. In the case of some of the older models the data may represent the only source of information, covering over 100 individual models. Each entry includes at least a circuit diagram, supplemented in most cases by the more important electrical and mechanical adjustments, and a brief resume of the manufacturer's original specification. Most entries also include details of printed circuit layouts.

RADIO, TELEVISION AND AUDIO TECHNICAL REFERENCE BOOK – Ames

To reflect the changes in hardware and maintenance practices, it was decided to publish this new reference book to serve firstly the needs of the technician who has to operate and maintain electronic equipment, and secondly, those of the engineer and designer.

In consequence, the book is a comprehensive and definitive source of information that will be invaluable to the technical assistant, the technical operator, the services man and the amateur radio or audio enthusiast. Mathematical presentation has been kept to a minimum and the book gives an essentially practical account of modern developments in radio, audio and television.

MASTER CREATIVE TAPE RECORDING – Gardner

In this book the theory of recording and reproduction is covered, as well as the choice of your machine and microphone, improvising a studio, and setting up of equipment. Guidance is given on the general organisation of recording sessions, and on the problems of recording drama, features and music, and of tape editing.

BEGINNER'S GUIDE TO INTEGRATED CIRCUITS – Sinclair

INTEGRATED CIRCUITS are more complex and versatile than equivalent circuits using discrete components. Yet at the same time they are smaller, cheaper and more reliable. There is now hardly any item of domestic electronic equipment not incorporating at least one integrated circuit.

This book is for the comparative newcomer to electronics, with some knowledge of transistor circuits, wishing to move on to an understanding of integrated circuits. Ian Sinclair first describes their principles and construction, then moves on to their many different uses. Many examples are given of practical integrated circuits. Both linear and digital integrated circuits are covered, and there is a brief

introduction to digital circuit techniques for the beginner unfamiliar with this type of circuit. The operation and uses of several specialised types of integrated circuits are also described. The book is copiously illustrated.

BEGINNER'S GUIDE TO RADIO – King

This new edition of **BEGINNER'S GUIDE TO RADIO** continues the work of its predecessors, which have given many thousands of readers a sound basic knowledge of radio principles and practice. Gordon King has again completely rewritten the text in order to keep up to date with radio technology while reorganising and improving the description of fundamental principles.

The book takes you in logical steps from the theory of electricity and magnetism to the sound you hear from the loudspeaker. It describes the nature of the radio signal, what is involved in transmitting and receiving it (including stereo broadcasting), and what kinds of equipment are needed. Then it examines the components of a receiver, and how they are built up into circuits that will do the various jobs required. Finally, it outlines the improvements that are incorporated in modern (especially hi-fi) receivers and loudspeakers.

Written as a non-technical, highly readable style, with a minimum of mathematics this guide provides the newcomer to radio with an enjoyable introduction to the subject; it will open the door to further reading and to greater skill in handling radio equipment, whether for work or leisure.

RADIO CIRCUITS EXPLAINED – King

Circuits used in modern radio receivers are examined in detail ranging from the simple transistor radio to the specialised hi-fi receiver. The book will provide a clear understanding of principles and operation and design parameters of contemporary sets. Invaluable to radio and audio service technicians, to the student and to anyone interested in radio.

110 INTEGRATED CIRCUIT PROJECTS FOR THE HOME CONSTRUCTOR – Mansan

A completely rewritten edition containing a practical introduction to five specific integrated circuits. The projects range from simple low-level amplifiers to precision measuring and indicating instruments, and include a host of unusual gadgets. All integrated circuits are internationally available and all circuits have been fully evaluated by the author. The book should be of equal interest to the amateur, the student and the professional engineer.

OP-AMPS – THEIR PRINCIPLES AND APPLICATIONS – Dance

This book is intended for home constructors and other electronics enthusiasts who require information on operational amplifiers in order to use them in conventional circuits. The text is written in an easily readable and non-mathematical style and is profusely illustrated with helpful circuit diagrams. A useful glossary of terms is included.

Please send me the following books . . .

48790H	()	Newnes Tape Recorder Servicing Manual 2nd Edition – Vol. 1	\$18.50
36687H	()	Newnes Tape Recorder Servicing Manual 2nd Edition – Vol. 2	\$17.50
43795H	()	Radio, Television and Audio Technical Reference Book	\$57.50
34322L	()	Master Creative Tape Recording	\$ 6.00
38453H	()	Beginner's Guide to Integrated Circuits	\$ 7.00
49129L	()	Beginner's Guide to Radio 8th Edition	\$ 7.00
36909H	()	Radio Circuits Explained	\$12.50
36669L	()	110 Integrated Circuit Projects for the Home Constructor	\$ 7.00
49281H	()	Op-Amps – Their Principles and Applications	\$ 5.50

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WHAT'S BLACK & WHITE AND TURNS 2-METRE OPERATORS GREEN?



THE KENWOOD TR-7400

This is the one, the Kenwood TR-7400 FM mobile transceiver of 25/10 watts and complete 2 metre band coverage (144-148 MHz). It has the largest digital readout in its class, and the 800 channel

coverage with PLL frequency synthesizer provides you with all existing and proposed Australian repeaters. A convenient front panel switch offsets the transmit frequency up or down 600 kHz.

WHENEVER YOU WANT TO MOVE UP — KENWOOD HAS THE WAY



TR-2200 2-metre VHF
FM portable receiver



R-300 all band or ham
band communications
receiver



The new
TS-520S HF
transceiver
— ideal for the novice



TS-700 2-metre VHF all
mode transceiver

NAME _____
POSTCODE _____
PLEASE SUPPLY ME
WITH MORE INFORMATION ON _____

Your nearest Kenwood dealer will be happy to give you more information on the entire Kenwood range of amateur radio products including the remarkable new TR-7400. Contact him direct or write to us at:-

International Marketing Dept.
Communications Equipment
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5-Chome, SHIBUYA - KU,
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KENWOOD DG-5 Digital display for TS-520S		175.00
KENWOOD DK-520 Conversion kit DG-5 to TS-520		25.00
KENWOOD TR-7400A 2M 25W FM 12V DC transceiver	Still only	400.00
KENWOOD TV-506 6M transverter	Still only	175.00
KENWOOD AT-200 Antenna match box		150.00
YAESU MUSEN FT-101E 10-160M AC / DC transceiver w / Speech processor		POA
YAESU MUSEN DM-901D Deluxe AC / DC 160-10M DIGITAL transceiver		POA
YAESU MUSEN FT-7 Mobile 80-10M 20W 12V DC transceiver		POA
YAESU MUSEN FL-2100B 80-10M 1200W Linear Amplifier		POA
YAESU MUSEN FRG-7 .5-30MHz General coverage receiver		POA
YAESU MUSEN SP-101B Extension Speaker		30.00
ATLAS 210X 80-10M Mobile transceiver c / with HD cable		825.00
FDK MULTI 800D 800 channel (5KHz) 2M FM transceiver 1-25W Adjustable output slow / med / fast up / down tuning free split VFOs Memory		325.00
FDK DD-800 Bright Remote display for the 800D for mobile use		40.00
FDK MULTI QUARTZ 16-24 CH. 10W 12V DC 2M transceiver w / crystals for repeaters 1 to 8 and channels 40 & 50	Still only	175.00
ICOM IC-2022M SSB Portable transceiver — a few only —	Still only	175.00
KEN KR-400 Azimuth antenna rotator w / 28V AC control / Indicator box		100.00
KEN KR-500 Elevation antenna rotator w / 28V AC control / Indicator box		125.00

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PL-259 suit RG-8U or RG-58U, Solderless PL-259 suit RG-8U or RG-58U	each	.75
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3 pin & 4 pin in-line microphone plugs	each	.85
3 circuit microphone jacks		.85
Car cigarette lighter plugs		.85
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3' lengths RG-58U with PL-259 connector each end		2.50
M-RING body mount		3.00
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MLS Right angle connector RG-58U to PL-259		.90

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SWR-200 Osker Block SWR/POWER meter, 100-200MHz - \$25

QTR-24 24 Hour World Clock - \$31

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V5-1 micro mini compressor, 46dB of compression - \$25

MC-801 Katsman mic compressor - \$45.

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FS-300B	160-10m x 2W Tvt	\$699
FT-110	16' F/B Linear Amp	\$235
FRG-7	16MHz Com Rx	\$325
YQ-301	HF Monitor/Capa	\$375
YQ-150	HF Monitor/Capa	\$375
YF-150	Dummy Load/Wattmeter	\$ 87
FP-301	series 200amp PG	\$183
FP-001 DM	160 - 10m Tvt	\$1475

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Technical Data:

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generator upper limit.

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AWARDS

COLUMN

Brian Austin, VK5CA
P.O. Box 7A, Crafers SA, 5152

AUSTRALIAN DXCC TOP LISTINGS AS AT 23-4-78

PHONE	VVKRU	VVK2D	VVK4K	VVK6MK	VK3AHD	VK4UC
	322/354	VVK2APK	300/313	VVK3NC	VVK3XB	280/300
	308/337	VVK4FJ	297/324	VVK5RL	VVK5TC	288/297
	308/331	VVK4PK	297/304	VVK5YL	VVK6BLK	295/301
	314/341	VVK4X	261/266	VVK6ML	VVK6SL	293/316
	313/344	VVK4Y	261/266	VVK6V	VVK6V	293/316
	304/325	VVK5AB	293/316	VVK6W	VVK6W	293/316
	301/306	VVK5YD	258/281	VVK6X	VVK6X	293/306

OPEN	VVK6RU	VVK2E	VVK4KJ	VVK4SD	VVK2APK	VK4FJ
	322/354	VVK4PX	304/315	VVK4TC	VVK3XB	280/300
	321/345	VVK4U	304/315	VVK5LG	VVK5NC	288/297
	318/339	VVK4X	301/311	VVK5YL	VVK5RL	297/297
	311/329	VVK4Y	300/323	VVK6BLK	VVK6V	295/301
	310/337	VVK4Z	292/309	VVK6V	VVK6SL	293/316
	309/341	VVK5AB	295/306	VVK6W	VVK6W	293/306

DXCC NEW MEMBERS SINCE 24-6-77

PHONE	VK4VC	Tally
	VK2YY	110
	VK4AAU	120
	VK3AGB	100

OPEN	VK7BC	Tally
	VK6FI	107

CW	VK4LV	Tally
		103

See previous AR for General Rules for ARI HF Awards.

WORKED ALL ITALIAN PROVINCES (WAIP)

1. The WAIP is issued to those amateurs who can show confirmation of a two way contact on the HF bands since 1-1-1949 with—
 - (a) a fixed amateur station in at least 60 provinces of the Italian Republic, for foreign amateurs;
 - (b) a fixed amateur station in at least 75 provinces of the Italian Republic, for Italian amateurs;
2. The same station may be worked twice or more, if in different provinces.
3. The minimum reports considered are: RST 338 and RS 33.

List of Italian Provinces:

Agrigento	Messina
Alessandria	Milano
Ancona	Modena
Aosta	Napoli
Arezzo	Novara
Ascoli Piceno	Nuoro
Asti	Oristano
Avelino	Padova
Bari	Palermo
Belluno	Parma
Benevento	Pavia
Bergamo	Perugia
Bologna	Pesaro
Bolzano	Pescara
Brescia	Placenza
Brindisi	Pisa
Cagliari	Pistoia
Caltanissetta	Pordenone
Campobasso	Potenza
Catania	Ragusa
Catanzaro	Ravenna
Cagliari	Reggio Calabria
Catania	Reggio Emilia
Como	Rieti
Cosenza	Roma

Cremona	Rovigo
Cuneo	Salerno
Enna	Sassari
Ferrara	Savona
Firenze	Siracusa
Foggia	Sondrio
Forlì	Taranto
Frosinone	Teramo
Genova	Terni
Gorizia	Torino
Grosseto	Trapani
Imperia	Trento
Isernia	Trieste
L'Aquila	Treviso
Latina	Udine
Lecce	Varese
Livorno	Venezia
Lucca	Vercelli
Macerata	Verona
Mantova	Vicenza
Matera	Viterbo

HEARD ALL ITALIAN PROVINCES (HAIP)

1. The HAIP is issued to those SWL who can show confirmation of a HRD since 1-1-1949 of—
 - (a) a fixed amateur station in at least 50 provinces of the Italian Republic, for Italian SWL;
 - (b) a fixed amateur station in at least 40 provinces of the Italian Republic, for foreign SWL.
2. The list of provinces is the same as for the WAIP.
3. The HAIP is divided into four classes:
 - (a) Phone — one band;
 - (b) Phone — two or more bands,
 - (c) CW — one band (at least 10 Hrd's on CW on the same band; the other Hrd may be on Phone);
 - (d) CW — two or more bands (at least 10 Hrd's on CW on two or more bands).

Starting 1-1-1978 DAIP and HAIP awards can be endorsed for single band and/or for all 95 Italian provinces.

WICEN

AN ABBREVIATED EMERGENCY PROCEDURE

The NSW WICEN Committee was asked to provide communications for the Schofields Air Show in October 1977. With no other guide available it was decided to use conventional procedure to handle formal type of traffic but it soon became obvious that a less formal, more efficient procedure was required to handle the traffic. Since the organisers of the Air Show were used to snappy aeronautical procedure they suggested that we could improve our efficiency if we changed our procedure. This was tried and proved on the second day to be an effective procedure for rapid emergency communications.

For those who have not listened to aeronautical communications the relevant principles are that it is a controlled net where sub-stations' call signs only are used since it is implicit that they are in contact with the control station unless stated otherwise. When a sub-station wishes to call control he does so by stating only his call sign and control indicates that he may transmit by repeating the call sign. If control requires confirmation from the sub-station he indicates by stating only his call sign. To signify the end of a transmission the substation states his call sign. The following example shows how this can be done in a WICEN operation or exercise and comply with the regulations as long as control identifies the net over every ten minutes. The regulations do permit abbreviated call signs to be used and two possibilities are to use the last letter of the call sign only if there are only a few stations in the net; or if there are more stations the last two or three letters of the call sign can be used. The latter has the advantage that the operator can readily recognise his own call sign even in the presence of interference and distractions.

Sub-station calls control — Bravo Mike Mike. Control acknowledges — Bravo Mike Mike. Sub-station message — Can you advise duration of exercise. Bravo Mike Mike.

Control message — Exercise will end at 1800. Bravo Mike Mike. Substation acknowledges correct receipt of message — Bravo Mike Mike.

It will take some time for operators to change from normal amateur procedures but I suggest you try it for your next exercise in case you need it in an emergency to handle large volumes of traffic.

Mike Richter VK2BMM,
NSW WICEN Deputy Co-ordinator.



WICEN operators at Schofields Air Show.

MAGAZINE

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Syd Clark, VK3ASC

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LARA

Ladies Amateur Radio Association

This month in our feature series we introduce a well-known YL - Mavis VK3KS. Mavis obtained her licence in 1959, having been coached by one Ivor Stafford VK3XB. World War 2 suspended Mavis' early activity on radio after she had been on air for three months using a 5 watt battery powered transmitter.

In 1943 Mavis and Ivor married and after the war ended they resumed operations on air. A stay in East Gippsland, where Ivor was teaching, presented the challenge of operating without electricity in their home. Undaunted, they worked with a 2½ watt input battery powered set.

Later on they returned to Melbourne and in 1951 they moved to their Box Hill South QTH, where they have gradually built and used a wide range of equipment. A large tower in the back garden supports the beam they use for DX working, while the array of certificates on the wall of the shack indicates their success.

Mavis has been active in the world of DX, having obtained many awards, in particular from the YRLH which she joined in 1950, sponsored by YL friends in the USA. She started joining in their competitions in 1958 and has been three times winner of the World DX Hafer Award in 1964, 1969 and 1970, and having joined the YL ISSBers in 1963, has also won the World 1st place YL/OM Team Trophy.

The calls 3KS and 3XB are famous in the world of CW and most of their awards are in the CW field exclusively. Mavis is a member of the First-Class Operators' Club, having been nominated for membership in November 1966. When she and Ivor

took a trip to England and the United States in 1974 they attended the FCC dinner held in England in October.

Amongst Mavis's certificates are those of the DX Century Club (having worked 254 countries), the DXCC QRP (power less than 100 watts), worked all States, all zones and all prefixes. Like Austinine VK3YL, Mavis also holds the WAC (worked all countries) award.

Among Mavis's other interests are floral art, gardening, knitting and crocheting and, until they left home, looking after her three children. Now, as a change, she gets to see her five grandchildren from time to time.

Unfortunately, arthritis has limited Mavis's activity over recent years, and we wish her the best of luck with her current course of treatment.

Another YL who has been in the news lately was Vicki Edmonds VK3ZTC, who featured in a segment on amateur radio of "This Week Has Seven Days" on Channel 7 in early May. Congratulations to our LARA TV star. ■

20 YEARS AGO

Ron Fisher, VK3OM

JUNE 1958

Today we are looking forward to WARC 79; 20 years ago we were looking forward to the equally important 1959 Geneva ITU Conference. An appeal for funds to send our own representative was in full swing. Just one pound per amateur was all that was needed. The Editorial page of June 1958 Amateur Radio was of course devoted to this important point.

Just twenty years ago Hans Ruckert VK2AO published his first article on a Triband Beam Antenna in AR magazine. Just to prove that there is nothing new under the sun, Hans produced an updated version in the April 1978 issue.

Amateur Television, part four, by Eric Cornelius VK3ECC, discussed the design of power supplies for the equipment described to date.

Temperature Compensation in Transistorised Receivers. How to stop frequency drift in those new fangled transistor receivers. The author, Hans Albrecht, is now minus the VK3AHM call sign and resident in West Germany.

Blind Lad Passes Oral Examination. In other words, Ray Bedson VK3ZEB passed his limited licence. A photo showed him tuning the AR7 receiver. Ray is still on the air with the same call sign and just as enthusiastic as ever.

A reprint from CO magazine, The Command Twins, a cheap all-band SSB receiver. In other words, an HF Command with a "Q-fiver" following.

Apparently the first wrist watch transmitter was built in 1958. A range of 1,000 yards was claimed. ■

DIVISIONAL NOTES

MODERN CONDENSER VERSION

VK2 DIVISIONAL NOTES

VK2 WICEN has recently arranged insurance coverage for its operators at both personal and operation levels. VK2 WICEN is accredited by both the State Emergency Services and the Police, inquiries about VK2 WICEN or any other group should be directed to the section involved c/- 14 Atchison Street, Crows Nest 2065.

The VK2 Division has undertaken the position of Federal Contest Manager from VK3. The Orange and District Amateur Radio Society will carry out the task.

The RTTY Section has its first AGM in early June. Interest has extended interstate. Inquiries via the Division. A weekly RTTY news bulletin of material as used in the VK2 voice broadcast may be received on 7 or 14 MHz on Sunday morning. There is a repeat on 3.5 MHz in the evening.

This year's South-West Zone Convention will be held October 7-8 at Wagga and an invitation is extended, as always, to interstate amateurs to attend. It will be the 26th annual event. ■

COMING EVENTS

GOLD COAST HAMFEST

The Gold Coast Radio Club are making pre-liminary bookings to be held on a country property on Saturday, 29th July, 1978.

In addition to the usual trade displays, radio station, Army stand, etc., the Club is also catering for families with a wide range of side shows and for families with a wide range of sideshows and dancing (old time) until late evening.

Further details from Kev Ayers VK4KD, Hamfest Organiser, 121 Nerang Street, Southport, Qld. 4215. ■

HAMADS

- Eight lines free to all WIA members. \$9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded. Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

Yaesu FR101 Rx, all bands, all modes, 160m through 2m and Yaesu FL101 Tx, 160m through 10m, \$1,200; 10 element 6m beam, \$50. VK3ET, QTHR. Ph. (06) 276 8928.

Admiralty 840 HF Rx working, fair condition, original control valves, except audio. Offers to VK4PDD, QTHR. Ph. (07) 397 3751 A.H.

Coxall Coax Belden 6214, 250 ft. What offers? Collins S2245 XMTTR WWII with MG set 1.5-12 Hz. Free. Collins GO9 XMTTR 3.0-18.1 Hz. Complete — Free. VK2BSP, Ph. (02) 48 6624.

MFJ Super Antenna Tuner, 200W, 10-160m, perfect condition and really works, \$60; also Micronta SWR and watt meter, separate meters, 10, 100 and 1000W, \$35. Both items practically new. VK2BEK, QTHR. Ph. (02) 476 5096, evenings.

Yaesu FT75B Tscr, FT75B-AC PS, DC75B-DC PS, FV50C VFO, 11 xtal freqs. and handbook, as new, \$500. VK3JS, QTHR. Ph. (03) 551 1367.

Yaesu FT100B Tscr, jump on 40m, otherwise GC, \$250. Des Taylor VK3BKT, Ph. (03) 459 9901.

For 2.3 GHz Band: Melabs 3-port circulator with termination, \$15; Narda directional coupler, \$15; bandpass filter, \$15; HP mod. 394 variable attenuator, 1.2-2 GHz, \$25. VK1VP, QTHR.

TS20, in good condition, with original carton, manual and bits, with microphone and spare set of finals, \$598. 18 AVT/WB ant., reasonable cond. with approx. 10m 52 ohm coax plus connectors, \$80. Must sell. VK2NBN/VK2ANB, QTHR. Ph. (02) 699 4903.

SSTV Monitor, similar to Robot 70A, fast/slow digital converter, WGLMD with full, half, quarter frame, video invert and grey scale generator, Eumig fast scan camera with optical through the lens viewfinder, 3.2 x 200m, \$500. Stan VK3BHZ, QTHR. Ph. (06) 71 7244.

Matched Pair 8850 Tubes, new, and suit Swan 700CX Tscr, \$16 the pr.; several VHF power tetrode tubes, type QVO3-20A, each \$8.50; other tubes, QVO4-7 at \$2, E26 at \$3, 5763 at \$2; xials BTG base types at \$3 each; 7027-7, 7006, 8016.6, 10833, 14080, 14375, 15030, 32500, 34000, 44000, all in kHz; top grade MC meters, 2½" 0-150V AC with cal mark for 115V, 10V; 2½" 0-8A DC with external shunt, \$8; the above square escutcheons, 2½" 0-200mA DC, circular movement calib. 0-50-100-150-200A, \$15; 2½" 5-0.5V DC circular movement calib., 5-4-2-2.4-5V, \$12; microswitches DPDT, new at \$3. VK2BFJ, QTHR. Ph. (043) 32 5758.

TM3 Km 3 3-element Beam, 14 ft. boom, 20, 15, 10m, \$150. Enquiries Ralph VK2XD, QTHR. Ph. (02) 651 1168.

Pye Overland FM706 Transceiver, hybrid, ch. 40, 50, R2, R8, 10W output, good clean unit with car cradle and handbook, \$60; TCA 1675 unit, ch. 40, clean, \$40. VK3ACM, QTHR. Ph. (057) 68 2250, evenings.

Collins KWM2 55B Tett with Collins AC power supply, spkr. Collins Samsonite CC-1 carrying case with new Shure 404C mic, had very little use, excellent, as new condition, \$1,695; also brand new Drake T4XC Tx with 160 and 11m, factory installed, Drake AC4 power supply, Drake R4C Rx with Drake noise blanker, Drake filters, extra receive xtils, including 160 and 11m, full international shortwave and marine band, WWV, all Drake factory installed, new Shure 404C mic. included, \$1,795; also used Hygial TH8 Yagi with owner's manual and Hygial BN86 balun, \$75. James Goodey VK2JJO, Ph. (02) 36 7756.

Fry Cambridge 3M FM Carphone with mic. and manual, \$35; 1676 low band AM carphone with manual, \$30; Heathkit HW-32A, 20m mono band transceiver mic. and manual only. Best offer. Coils for 80 and 40m also included. FT-DX401 transceiver with noise blanker and speech processor, good cond., \$385 or best offer. VK3AQD, QTHR.

Yates FRG7 Rx, \$220; BWD CRO 599C with probes, \$450; RF oscillator Tech TE20D, \$45; multi-band portable Rx, \$30; Lenco LB4 auto turntable, \$150; GC4 Rx/Tx (no power supply), \$15. Eltham, Ph. (03) 439 1527 A.H.

Set of Asahi Mobile Antenna 80 to 10, complete with bumper mount, etc., \$80; matching balun for same, \$15; Waters com. preamp, \$20; Shure 444 microphone, little used, \$35. VK3TG, QTHR. Ph. (058) 52 1636.

Mult 7 2m Transceiver, 40, 50, R1, R2, R3, R4, R5, R6, R7, R8, \$170; Lafayette HA-600A automatic receiver with external speaker, \$160. Both mint condition. VK2BOD, Ph. (02) 727 3272.

Yates FL2100B, 2-y-o, new 5728s, excellent cond., 400W PEP on all bands 80-10, \$90 or close offer; Elmas 4/125 Tetetrode, suit HIF or VHF PA, new with socket, \$20; AWAS BS50D with two w/w working RC-1A remote control and two channel switches, ch. 7, 4, B, \$250; \$100. OMNO: suit 6/40, 6146B and 5728 valves, new and used, offers? Contact VK3QOT, QTHR. Ph. (055) 72 3166, Bus.

Cleaning Out Shack — New 100PF Johnson Tx cap., \$5 ea.; AWAS 25W 2SW lo-band PA and exciter boards (data available), \$40; Collins mech. filter, 455 kHz, \$30; power transformers. Send s.a.e. for full list. Mark Webster VK2BAK, QTHR. Ph. (02) 48 6245.

Hammerud HQ170 Rx, 1.8 to 54 MHz, \$200; HX500 Tx, \$200; or \$300 pair; Hallicraftter HT32 ZC, 240V, requires 110V for fan, \$100; SX15 RX, 110V transformer supplied, \$200; or \$250 pair; AVO multimeter EA113, \$100; AVO model 7, \$25; "Micronita" transistor tester, \$20; Pat Ashby, Ph. (02) 57 5033, VK2AJ, QTHR. Ph. (02) 57 5718.

Europa-B 2m Transverter, 200W PEP output, with spare tubes, only 1/2 hours use, VK2AJT, QTHR. Ph. (044) 26111 (Bus.), (044) 22786 (A.H.).

Estate Late VK2OW, FL2100B linear in mint cond., with manual, less than 10 hours use, for quick sale, \$400. VK2OL, QTHR. Ph. (02) 76 6861.

ICOM IC22A 2m Transceiver, repeaters 2 to 8, simplex 40, 50, 51, mobile bracket and mic., good cond., \$150. VK2BAD, QTHR. Ph. (02) 72 1107.

Yaesu FT101B, excellent cond., with instruction book and mic., \$500. Reg Jones VK2AGP, QTHR. FT301D and matching power supply, \$1,000; FV301, remote VFO, \$125. All units as new. VK3TG, QTHR. Ph. (058) 52 1636.

Hygain 2 Element Quad, 10-15-20m, almost new, with a 25 foot triangular steel tower, has built-in facility for extending higher, \$250. Ph. (03) 598 9298.

Galvanised Tower with all hardware, crank-up, guyed 70 ft up 25 ft, suitable for 10m, \$850 or will swap for Emulator 502CXH rotator or similar model to heavy duty rotator in working condition. Contact G. Stevens VK3ZSQ, QTHR, or C/- Radio 3SR Shepparton for details. Ph. (058) 21 4477 (Bus.).

FTDX100, good condition, AC/DC, complete, \$375, CNO. VK3ADW, QTHR.

Hewlett-Packard 355C and 355D, variable attenuators, DC to 1 GHz, as new, \$110 for both; Ham-II rotator, brand new, \$160. VK1VP, QTHR. Ph. (062) 48 5882, A.H.

KW77 Rx, covers amateur bands 160-10m, Crown-coded CTR 5400 battery operated 5 in reel to real portable recorder, Telefunken Magnetophon 204 stereo 7 in. reel to reel recorder, all in good condition. Offers to 1306 Glenhuntly Road, Glenhuntly, Vic. 3163.

Yaeu FT101E Transceiver, current model, with superb set of 3 new valves, \$750; Yaeu FV101B, external VFO, \$110; Yaeu YC610, digital display, \$210. All equipment "mint" condition. VK3SB, QTHR. Ph. (03) 550 3521.

W2AU Balun, new, in original package. Ken product RF speech processor, Model KPC-12A. Used less than ten hours. Roth Jones, VK3KBG, 23 Gaudent Rd., Doncaster East 3109.

Yaeu FT301D Transceiver, complete with matching deluxe FP301D power supply, one month old. Cost \$1,440, sell \$1,200. ONO, P. Drady VK2NIE, Gillard's Lower Bucca 2493, Ph. (066) 54 3205.

10m Transceiver, ex CB, 23 ch., 12W PEP, 240V AC/12V DC, with built in SWR meter, \$180; also Midland 13-822 24 ch. 12V DC only, \$140. Ian VK3NCY, Box 322, Mentone, 3194.

Asahi 14 MHz, 3 el., full sized beam, 18 ft. boom, gamma match (no balun required), 25 dB front/rear ratio, VSWR 1.5:1 or better, unused, complete with canton and instructions, \$155; 3 el., 14 MHz mini-beam (Zigil beam as per Radio Communications), good performer for restricted space or light weight rotator, \$65. VK3ARZ, QTHR. Ph. (03) 232 9492.

Yaeu FLDX2000 Linear, 1200W PEP, excellent condition, \$225. VK3CR, QTHR. Ph. (03) 722 4039.

Standard SR-C145B 2m FM 5 ch. Hand-held Tett, with nicad batts., AC charger and stand, ext. mic. case, English manual, \$145. VK6GPY, QTHR. Ph. (09) 271 7192.

Tentec S44 Triton IV, includes noise blanker, CW filter, special electro-voice microphone and AC power supply, DC 25 amp circuit breaker fitted, \$1,300. New Feb. 1978. VK5ZJP/VK5NP, QTHR. Ph. (09) 371 1638.

WANTED

Self-supporting Telescopic Till-over Tower, to 35 ft extended, if fitted with heavy duty rotator will purchase that as well. Will pay top price for the right tower. Sufficient dismantling by the seller will be required to facilitate shipping to my QTH. VK2BFJ, QTHR. Ph. (043) 52 5758.

Anyone going solid state? Crystals for AWA MRSA on 2m FM wanted, channels R3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, \$25. David VK3ZDT, Ph. (03) 449 9649.

FT101B or similar, suit Novice, Rx covering amateur bands, rotator for small beam, freq. meter 3-30 MHz. Details to VK3NLL, 54 Spruhan Ave., Norlane 3214.

Any Amateur Radio Gear in any shape or form for the Royal Melbourne Institute of Technology's Amateur Radio Society, VK3MT. We have no gear and would like to get back on the air and have some nets with other school societies and amateur stations. Bruce Kendall VK3ZDM, QTHR. Ph. (03) 741 2382.

Help from Six Metre Operators to buy Yaeu FT6V50B to send to VR4DX. Seven already in on the scheme (VK3OT, 3AMK, 3AKK, 3BID, 3ZZK, 6BV, 8GB), 13 more required. Aim is to have a 6m rig to loan for DX purposes to any worthy cause. You will have a say in its use and get the new country on six. Contact VK3OT, VK3AKK or VK3AMK if you wish to help.

FT200 Transceiver, complete with PS mike, manual and in good order. VK2AFP, QTHR. Ph. (066) 85 6217.

IC202, reasonable cond. VK5ZAT, Ph. (08) 277 5441 A.H.

FT406, ext. VFO or circuit diagram, to buy or borrow. For copying. VK3LP, QTHR.

FP75B or suitable HT transformer for same. VK4NAX, 23 Drummer St., Toolooa Est., Gladstone 4680.

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. E. B. WHITE, M.B.E.
Mr. R. EDELSTON-POPE
Mr. R. D. R. TRACY
Mr. M. BROWN

VK2HA
VK3ARP
VK3ART
VK2OR

RICHARD EDELSTON-POPE

Many members will be saddened to learn that Dick Pope finally succumbed to a long-standing condition on 17th April, 1978. His cheery personality and wise counsel will be missed by very many amateurs, both locally and around the world.

Dick was brought up in Sydney, where he was actively interested in ham radio well before the Second World War. He obtained a Diploma of Commerce from Sydney and, during the war years, he served in the Royal Navy, first in the North Atlantic and then in command of a group of naval vessels engaged in escort and mine-sweeping duties in the Mediterranean Sea. He was awarded a DSC for his services before and during each of the Allied landings in Italy and South France and became known as "D-Day Dick"!

In 1946 he came to Melbourne to take a leading part in the setting up of TAA, becoming Director of Finance and Administration.

Dick took out his ham licence in 1950 and quickly made many fine friends. He was very active on construction work and for a time was Acting Treasurer of the WIA Victorian Division. He was, incidentally, very active as a worker for the Legacy movement.

Our sympathy goes out to his wife, Isobelle, and his family.

Very many of us have lost a very good friend.

Alan H. Reid VK3AHR.

Matching VFO and Speaker Unit for Unides 2020. Write details J. Moyle VK4ZT, QTHR.

Ham II, complete with indicator and control cable. VK3AMC, QTHR. Ph. (03) 92 9036.

Kenwood TS-520S in good working condition, 1-2 years old, also components suitable for linear ceramic capacitors .001 up, 5 KV x 2; variable capacitors (1), 10 pF-50pF (2), 1000 pF, both HV spacing and large capacitors suitable for power supply (2) 8KV, 7.5 KV. Details and dimensions to VK4AABS, QTHR. Ph. (07) 351 3298.

Has anyone got old faulty 80m Resonator Coil from an 18 AVT/WB they would let me have urgently? Also wanted 30L1 linear, any cond., even faulty, but complete. VK4LN, QTHR. Ph. (071) 82 2675.

EXCHANGE

Exchange Alias 215 for an Alias 210. My Alias 215 is about 2 years old and is in first class cond. VK4XT, QTHR. Ph. (074) 62 2389.

TRADE HAMADS

For a very long time commercial advertising has not been accepted in AR Hamads, but as the result of discussions at the 1978 Federal Convention a decision was made to open up a "Hamads-Trade" section. The rate will be \$10 for 4 lines plus \$2 per line (or part thereof), minimum charge \$10, payable. Copy is required by the first day of the month preceding publication. This will mean that in future ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

VICOM WON'T SELL YOU A RIG, IN A FACTORY-SEALED CARTON!

When you purchase your ICOM, YAESU and KENWOOD product from VICOM, please don't expect to receive it in a factory-sealed carton. When we despatch any of these fine pieces of equipment to you we want to be certain it meets or exceeds the manufacturer's specs. We thoroughly pre-delivery check all transceivers before shipment and back this up with our VICOM 90 day warranty.

If getting a super discount from a backyard "bootlegger" show is important to you — or if you insist on a factory sealed carton from a supermarket, we suggest you shop elsewhere.

But if you want the positive assurance that you are receiving the value and performance you're entitled to plus ethical business conduct — then VICOM is the supplier for you!

accessories

MORSE KEYS

HK702 deluxe Key with marble base

\$35.00

HK708 economy Key

\$19.00

HK706 operators Key

\$20.00

MK701 manipulator (slide-swiper)

\$38.00

EK103W electronic Keverb

\$159.00

CODEC CONVERTERS

14MHz to 28MHz 1F

\$69.00

43MHz uses 28MHz 1F

\$59.00

1296 MHz uses 28MHz 1F

\$65.00

2m LINEAR

Q70 high power, 70w pep max, 2 metres

\$129.00

LOW PASS FILTERS

F300DM 32MHz Fc, 1. Kw max, 3 stages

\$30.00

F300LS 32MHz Fc, 200w max, 3 stages

\$20.00

SWR/PWR METEFS

VZ7 high tuner, 3-150MHz

\$34.00

OkerGain SWR200, 2. 200MHz

\$75.00

SW10A 14G-500 MHz, quality

\$98.00

SW210A 1.8-150 MHz 20/120W direct reading

\$79.00

SWX-77 professional 1.8-30MHz

\$125.00

MICROPHONES

VM-1 noise-cancelling, dynamic, low Z

\$8.90

VM-2 desk mic, dynamic with preamp, low Z

\$29.80

BALUNS

AS-BL for beams

\$31.00

BL50A 50 ohm 4Kw model, for dipoles

\$25.00

BL70A 70 ohm 4Kw model, for dipoles

\$26.00

antennas

TRAP VERTICALS

V4JR Negara 40-10m, 5.2m high, no guys

\$96.00

V5JR Negara 80-10m, 6.7m high, no guys

\$129.00

14AVQ/WB Hy-Gain 40 thru 10m

\$109.00

1BAVT/WB Hy-Gain 80 thru 10m

\$149.00



Amateur Radio Systems.

NEW SHIPMENT

HF BEAM ANTENNAS

TH6DXX Hy-Gain Thunderbird 10/15/20

\$355.00

TH3JR Hy-Gain 10/15/20 3el

\$209.00

TH3MK3 Hy-Gain 10/15/20 3el

\$279.00

203BA Hy-Gain 3el monobander, 20m

\$199.00

204BA Hy-Gain 4el monobander, 20m

\$259.00

SY/2m Jaybeam, 7.8dBd, Length 1.6m, 8el

\$35.00

SY/2m Jaybeam, 9.8dBd, Length 2.8m, 8el

\$45.00

10Y/2m Jaybeam 11.4dBd, Length 4.4m, 10el

\$77.00

10Y/X/2m Jaybeam Xyagi, 11.3dBd, 10el

\$89.00

AS210BW Asahi twin 10el, 18dB gain

\$119.00

HF MOBILE ANTENNAS

HUSTLER

RM10, 10m Resonator

\$16.00

RM15, 15m Resonator

\$16.00

RM20, 20m Resonator

\$16.00

RM40, 40m Resonator

\$20.50

RM80, 80m Resonator

\$22.00

MO2 fold-over mast

\$22.00

BM-1 bumper mount

\$29.00

MARK HELICALS

\$24.00

HW40, 40m top loaded

\$30.00

HW20, 20m top loaded

\$30.00

MOBILE WHIPS

2m ANTENNAS

The RINGO RANGER ARX-2 is a 2m gain omnidirectional antenna with three half-waves in phase and a one-eight wave matching stub. The Ringo Ranger gives an extremely low angle of radiation for better signal coverage. It is tunable over a broad frequency range and perfectly matched to 52 ohm coax. Price \$49.

4dB gain with reference to half-wave dipole.

8dB gain with reference to quarter-wave whip.

Lindemann 2m mobile whip

\$35.00

Square 1/4 wave whip, 2 metres

\$6.50

Scalar 5/8 wave whip, 2 metres

\$16.70

Magnetic base KLMG

\$19.00

70cm BEAMS

80/70cm Jaybeam, 8BeI, 15.5dBd gain
48/70cm Jaybeam, 8BeI, 15.7dBd gain
PBM18/70cm Jaybeam, 8BeI, 14.9dBd gain, 1BeI
DB/70cm Jaybeam twin 8el, 12.3 dBd gain
PBA1200 Daiwa Parabolic dish, also 1.2GHz

\$99.00

\$76.00

\$69.00

\$89.00

\$349.00

TRAP DIPOLES

Midy VN 10m trap dipole

\$99.00

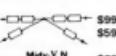
ALL4DXN 40m & 80m trap dipole

\$59.00

DIPOLES

A4VPN 40m dipole kit

\$29.00



NEW ITEM



QUALITY antenna change-over relay

Two new models

Model CX-2L

Frequency Range: 1.8 thru 170 MHz

Power Rating: 100w pep

Power Req'd: dc 10-15V

Price: \$45

Model CX-2H

Frequency Range: 1.8 thru 450 MHz

Power Rating: 200w pep

Power Req'd.: dc 10-15V

Price: \$59.

Head Office and Mail Orders:

vicom Ph (03) 699.6700
68 Eastern Road
Sth Melbourne Vic. 3205
Adelaide 43.7981 Canberra 82.3581 Perth 446.3232 Brisbane 38.4480 Hobart 43.6337

Direction: Russell J. Kelly

Peter D. Williams

TLX 30566

Robert 43.6337



TSB20S HF transceiver, digital

\$1172.00

TS5200 HG transceiver 160-10m

\$747.00

TV500 6m transceiver

\$249.00

TR7400 2m digital mobile transceiver

\$483.00

TR7500 2m mobile synthesised transceiver

\$399.00

MC50 desk mic.

\$58.00

MC10 2pt hand mic.

\$16.00

AT200 matching antenna tuner

\$169.00

SP2/20 matching speaker for TS820s

\$58.00



FT-101E transceiver, 160 thru 10m

\$899.00

FT2100B HF linear amplifier

\$578.00

FRG7 Communications Receiver

\$349.00

FT77 HF mobile transceiver

\$569.00

FT901DM HF transceiver

\$15.00

VO301 Monitor scope

\$349.00



PORTABLES AND ACCESSORIES

IC202E 2m sbb portable

\$219.00

IC502 6m sbb portable

\$219.00

IC215 2m fm portable

\$219.00

BC200 nicad pack with Charger

\$54.00

ICSM2 desk mic.

\$98.00

IC50L 6m linear, 10el out

\$98.00

IC20L 2m linear, 10el out

\$98.00

Mobile brackets for portables

\$17.00

2m TRANSCEIVERS

IC245 2m fm digital mobile

\$450.00

IC211 2m all mode transceiver

\$750.00

IC225 2m fm mobile

\$299.00

90-DAY WARRANTY ON ALL NEW PRODUCTS

SPECIAL

VOX-3 VOX attachment for TS700A transceiver

\$20.00

PROCESSORS and COMPRESSORS

MC330 audio mic compressor

\$71

RF440 rf processor, ac/dc

\$119

RF550 rf processor with crystal filter

\$150



QUALITY HF SPEECH PROCESSOR

4 position quality coax switch

frequency range up to 500MHz

high isolation, unused outlets grounded

insertion loss better than 0.2dB

impedance 50 ohms

contact resistance 20m ohm

commercial quality

Price: \$49.90

WARNING: The law requires that a licence be held for all transmitting equipment.

NEW



**DRAKE**

C-Line Amateur Equipment



\$795

Drake R-4C

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. In addition to the ham bands, tunes any fifteen 500 kHz ranges between 1.3 and 30 MHz, 5.0 to 6.0 MHz not recommended. Can be used for MARS, WWV, CB, Marine and Shortwave broadcasts.

Superior selectivity: 2.4 kHz B-plate filter provided in ssb positions. 8.0 kHz, 6 pole selectivity for a-m. Optional 8-pole filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.

Tunable notch filter attenuates carriers within passband.

Smooth and precise passband tuning.

Transceive capability: may be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.

Usb, lsbb, a-m and cw on all bands.

Avg with fast attack and two release times for ssb and a-m or fast release for break-in cw. Avg also may be switched off.

New high efficiency accessory noise blanker that operates in all modes.

Crystal lattice filter in first i-f prevents cross-modulation and desensitization due to strong adjacent channel signals.

Excellent overload and intermodulation characteristics.

25 kHz Calibrator permits working closer to band edges and segments.

Scratch resistant epoxy paint finish.



\$47

Drake MS-4

Drake MS-4 Matching Speaker for use with R-4, R-4A, R-4B and R-4C Receivers. (Has space to house AC-3 and AC-4 Power Supplies).

ELMEASCO**Instruments Pty. Ltd.**

\$695

Drake T-4XC

Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.

Covers ham bands with crystals furnished. Covers all of 80, 40, 20 and 15 meters, and 28.5-29.0 MHz of 10 meters.

Covers 160 meters with accessory crystal. Four 500 kHz ranges in addition to the ham bands plus one fixed-frequency range can be switched selected from the front panel.

Two 8-pole crystal lattice filters for sideband selection.

Transceives with the R-4, R-4A, R-4B, R-4C and SPR-4 Receivers. Switch on the T-4XC selects frequency control by receiver or transmitter PTO or independently. Illuminated dial shows which PTO is in use.

Usb, lsbb, a-m and cw on all bands.

Controlled-carrier modulation for a-m is com; with ssb linear amplifiers.

Automatic transmit-receive switching. Separate VOX time-delay adjustments for phone and cw. VOX gain is independent of microphone gain.

Choice of VOX or PTT. VOX can be disabled by front panel switch.

Adjustable pi network output.

Transmitting agg prevents flat-topping.

Meter reads relative output or plate current with switch on load control.

Built-in cw sidetone.

Spotting function for easy zero-beating.

Easily adaptable to RTTY, either fsk or afsk.

Compact size; rugged construction. Scratch resistant epoxy paint finish.

High Pass Filters for TV Sets

provide more than 40 dB attenuation at 52 MHz and lower. Protect the TV set from amateur transmitters 6-160 meters.



Drake TV-300-HP

For 300 ohm
twin lead \$13

Drake TV-75-HP

For 75 ohm TV coaxial
cable; TV type
connectors installed \$17

Write, 'phone or call for technical information.

P.O. Box 30, Concord, N.S.W. 2137.
Telephone: 736-2888.
Melbourne: P.O. Box 107, Mt. Waverley, Vic. 3149
Telephone: 233-4044.
Adelaide: 42-6666; Brisbane: 392 2884.
Perth: 25-3144.



MN-4 (Model No. 1507)



MN-2000 (Model No. 1509)

Drake MN-4 & MN-2000 Matching Networks

* Integral Wattmeter reads forward power in watts and VSWR ratio; can be calibrated to read reflected power. * Matched 50 ohm transmission line to coax antenna feeding with VSWR of at least 5:1. * Covers ham bands 80 thru 10 meters. * Switches in or out with front panel switch. * Size: 5½" H. 10¾" W. 8" D (14.0 x 27.3 x 20.3 cm). MN-2000, 14¾" D (36.5 cm).

* Continuous Duty Output: MN-4, 200 watts; MN-2000, 100 watts (2000 watts PEP) * MN-2000 only: Up to 3 antenna connectors selected by front panel switch.

TVI Filters

Low Pass Filters for Transmitters

have four pi sections for sharp cut off below channel 2, and to attenuate transmitter harmonics falling in any TV channel and fm band. 52 ohm SÖ-239 connectors built in.

Drake TV-3300-LP

1000 watts max. below 30 MHz. Attenuation better than 80 dB above 41 MHz. Helps TV I-f interference, as well as TV front-end problems. \$32

Drake TV-5200-LP

200 watts to 52 MHz. Ideal for six meters. For operation below six meters, use TV-3300-LP or TV-42-LP. \$32

Drake TV-42-LP

is a four section filter designed with 43.2 MHz cut-off and extremely high attenuation in all TV channels for transmitters operating at 30 MHz and lower. Rated 100 watts input.

\$19

Prices shown include Tax

The Bulletin.

PATRON: His Excellency the Governor,
Air Chief Marshall
Sir Wallace Kyle G.C.B., C.B.E., D.S.O., D.F.C., K of St John.

* * * * *

All material for inclusion in The Bulletin, to reach the Editor by phone, mail, or on air by the 10th of each month. Postal address 22 Salisbury St., Leederville. 6007. Phone 4442909.

Correspondence ; All other correspondence should be addressed to :-

Hon. Secretary,
W.I.A. (W.A. DIV.).
P.O. Box N1002.
PERTH. W.A. 6001.

GENERAL MEETING. Held on the THIRD TUESDAY of each month at Science House, 710 Murray St. (formerly Hooper St) West Perth, commencing 7.45 p.m.

COUNCIL MEETING.

Held on the FOURTH TUESDAY of each month at the Scout Hall, Cnr JOSEPH AND WOOLWICH ST WEST LEEDERVILLE commencing 7.30 p.m. OBSERVERS WELCOME.

The following letter was recently received by the President. Please read it carefully and if you have any ideas or are prepared to help in any way CONTACT A COUNCILLOR.

" As you know, next year is Western Australia's 150th Anniversary and a wide ranging programme of events is being planned to celebrate the State's birthday.

I understand that the Wireless Institute of Australia is possibly the oldest radio society in the world and wondered whether the W.A. Division would consider promoting some event suitable for this historic occasion.

For example an exhibition spanning early wireless equipment and allied memorabilia to modern electronic communication equipment, and which might be held in conjunction with an international or national conference held in W.A. in 1979. It may be that something of this type would earn the support of Telecom Australia.

I would be pleased to know if the suggestion has interest for the Institute.

S.W. Dallywater .

Director.

At the Council Meeting for April the following Office bearers were appointed.

As laid down in the Constitution, the members present at the Annual General Meeting elected Mr. L.A. Ball, VK6AN President
Mr. A. Maschetti Vice-President.

As insufficient nominations for Council were received in spite of an extended nomination period, it was not necessary to hold a Ballot and the nominees received were elected to Council. They were, in addition to the President and Vice-President, Mr.P. Savage, VK6NCP, Mr.A. van den Avoort, VK6CU, Mr. I. Hillier, VK6LQ.

Hon. SECRETARY:	Mr. P. SAVAGE	VK6NCP	4013912.
Asst. SECRETARY	Mr. B. Hedland-Jones	VK600	
TREASURER:	Mr. A. van den Avoort	VK6CU	2715432
Asst Treas.	Mr. J. Kitchin	VK6TU	3499342
MEMBERSHIP Sec.	Mr. D. Wallace	VK6IW	3413655
Minute Secretary	Mr. M. Cliff	VK6ZKY	2713941
Broadcast Co-ord.	Mr. J. Young	VK6JY	2931109
PROGRAM Organiser	Mr. I. Hillier	VK6LQ	
Equipment	Mr. A. Baxter		3493335
BOOKSALES	Mr. C. Dodd	VK6DV	4465364
CONTEST Mgr.	Mr. C. Waterman	VK6NK	
QSL Manager	Mr. J. Rumble	VK6RU	3859664
* I. W. Co-ord.	Mr. D. Couch	VK6WT	3819242
* Publicity Off.	Mr. D. Dyke	VK6NAD	

* Yet to be confirmed

At this time also the position of Patron is still to be confirmed but it is hoped that the Governor, Sir Wallace Kyle will continue in this capacity.

Thanks to those who stepped forward and offered their services, it is obvious from the above list that they were soon co-opted to Council and provided with tasks. Will someone step forward and offer to be Editor in Chief of the Bulletin ?

* * * * *

HAMADS.

WANTED

WANTED

WANTED

General -coverage Receiver in good working order must have SSB facility and cover amateur bands.

Please state price and details to:-

Mr.K.Sier, 22 Marshall Ave.,

Pinjarra

Phone 095 311946.

* * * * *

REPORT ALL INTRUDERS - - - and this means CB operators who have "over flowed" onto 10 metres and also migrated to 2 metres. Out with the snoop loops. Then phone in your reports to the I.W. Coordinator.

Herewith a brief rundown on the General Meeting held 16th May.

The meeting was opened at 8.00 p.m. with the new President, Les VK6AN in the chair, flanked by the new Secretary Peter, VK6NCP, and new Minute sec, Maurice VK6ZKY. After the minutes of the last meeting had been read and received, apologies were recorded from VK6ZDN, 6HC, 6MO, 6IC, 6NC, 6KW.

The chairman then welcomed the President of the VK7 Division who was among the visitors. He also welcomed students from the Technical Colleges and extended best wishes to those who had sat for the examination during the day.

Correspondence was read and received.

Reports. A brief report from the Treasurer all O.K.

QSL Buro: Don VK6DY, Acting Buro Manager indicated that cards were still flowing freely.

Broadcast Co-ordinator VK6JY said that the three-weekly roster system seemed to be quite popular and suggested that news items be phoned to the Duty B/C officer. He appealed for tapes of a technical nature. W.I.C.E.N. Des VK6SU reminded members of the forthcoming W.I.C.E.N. meeting on Friday 19th May.

Programme Organizer Ian VK6LQ advised the meeting that a video tape of the Amateur Radio segment of "This week has Seven Days" had been obtained and would be shown after the business portion of the meeting. He appealed for lecturers on general topics. As liaison officer for the M.A.R.T.G he advised that the Group was currently without premises.

Repeater Group Liaison Officer, Adrian VK6CU, reported that Ch4 was currently off the air and had been replaced by Ch6 for testing purposes. The group's A.G.M. would be held on Saturday 20th May. Subscriptions were also due.

I.W. Co-ordinator, David VK6WT, thanked those who had contributed reports during the year and suggested that anyone with a report should phone it to him. He had received a letter from the Federal I.W. Co-ord. VK3LC, together with a supply of report forms. David thanked the News Broadcasters for making available the I.W. slot on the Sunday broadcasts.

Membership Secretary Dave VK6IW was unable to present any new members to the General Meeting due to a technicality. He advised that there were now 321 Full Members, 90 Associate Members, 41 grouped as student, club, pensioners etc and 5 Life Members making a total of 457 as at the April listing.

A motion proposed by Peter VK6HU suspending standing orders allowed the names of applicants for membership to be read to the meeting. They were :-

John Ross Fenwick, Frank Lenzo, Gordon Keith Nichols,

Christopher David Rumble.

Scout Liaison Officer VK6HU informed members that preliminary information regarding J.O.T.A. 1978 would be going forward to scout groups. VK6AN passed on the thanks of the Scout Association Task Force to those amateurs who participated in the Swantiki-WICEN exercise.

The chairman indicated to the meeting that as there were only five elected Councillors, which number also constituted the necessary quorum if any Councillor was absent from a Council Meeting it was likely to cause some delays in handling Institute business. A number of members put forward their ideas as to how the situation could be overcome.

David VK6OM raised the question of personalised vehicle number plates, however it is unlikely that the present system will be altered for some time.

Henry VK6DC again asked that "handles" be included in the VK Callbook.

The meeting was closed by the chairman at 8.45 p.m. and after a brief pause for the usual cuppa members were able to watch the replay of the T.V. programme already mentioned. Our thanks to those responsible for the taping (VK6RH and VK6CU, I think). * * * * *

MEMBERSHIP SECRETARY'S REPORT.

I submit the following report on the state of the membership numbers for the year ending March 1978, the reason for using March instead of April is that the computer sheets for April do not arrive in VK6 till May which is well after the A.G.M.

This year has shown a better increase in members than the previous year a lower number of unfinancial members in March than the same time last year and this year has seen the Highest total ever of members in this Division of the W.I.A. To help in comparing the increase for this year with the previous year the following figures should help.

		TOTAL MEMBERS	OVERALL INCREASE	NEW MEMBERS	UNFINANCIAL MEMBERS
1978	March	453	+85	23.1%	108
	February	448	+80	21.7%	100
	January	434	+66	17.9%	86
1977	March	368	+19	5.4%	62
	February	373	+24	6.9%	58
	January	368	+19	5.4%	52

In the above table I have tried to show the increase in members and the decrease in unfinancial members for the last three months of the 1977-78 year as compared with the year 1976-77 (a whole year was not used in the table as the final months show the total increase).

You will see for the year 1977-78 there was an increase of 35 or 23.1% which is about 5 times that of the year 1976-77 increase of 19 or 5.5%. This I feel indicates the interest shown in the W.I.A.

Now when you look at the numbers of new members you will see the total of 108 exceeds that of a gain in membership of 85 by a sum of 23, this is brought about by transfer of members to other Divisions and those who for reasons of their own, resign.

The final figures for unfinancial members shows a lower figure, 54 or 11.9% for this year as compared with 62 or 16.8% for the previous year, although the January figures show that more members paid earlier last year than this.

Of course the increase in new members means the issue of Certificates to them as well as those who change their grade of membership so the numbers will not be the same as new members and also the totals may not be the same as the members at the same time as there have been delays in issuing certificates (running out etc), the following figures will show this:-

Certificates issued.

1978 -- 25, 1977 -- 95, 1976 -- 65.

The issuing of Certificates for new members is not all, the first year's subs have to be paid into the Federal Office bank account - - -

	Members Subscriptions	New Members
1977 -78	\$2371.00	108
1976 -77	\$ 958.00	62

As seen from the above figures not only has the membership increased but the amount of subscription has also increased, so all told there is a great change in this year in the interest shown in the W.I.A. VK6 Division, a change I would like to see continue in the next year. Dave Wallace VK6IW.